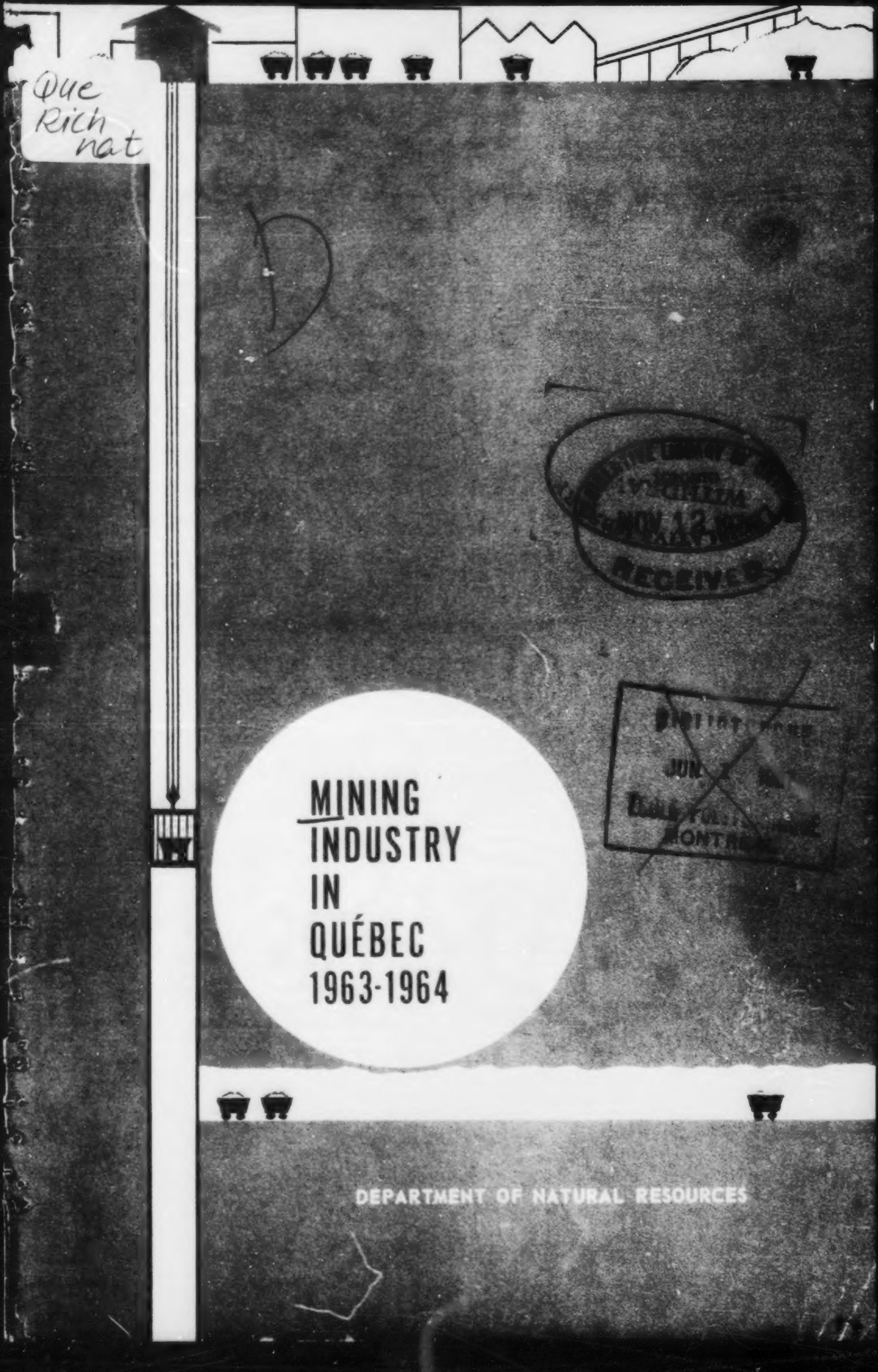

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MINING INDUSTRY IN QUÉBEC 1963-1964

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RAPPORT GEOLOGIQUE 153 *GEOLOGICAL REPORT*

REGION DE ROLLAND COUSINEAU LEGENDRE AREA

PAGE	PARAG.	LIGNE *LINE*	A LA PLACE DE/*INSTEAD OF*	LIRE/*READ*	
II	-	-	Gneiss à hornblende et à biotite	Hornblende and biotite gneisses	2
V	-	-	pyrobilite and pyroclastic	pyribolite and pyriclastic	2
4	1	9	Courtemanche (1930)	Courtemanche (1959)	1
9	2	3	2,200 pieds.	2,200 pieds (Osborne, 1936C, p. 60).	1
9	2	3	(Osborne, 1963C, p. 60)	(Osborne, 1936C, p. 60)	2
11	3	3	modificatifs sont ajoutés	modifications sont ajoutées	1
13	Fig. 2	-	(Berthelsen, 1960 p. 120).	(Berthelsen, 1960 p. 20).	1&2
16	1	12	gneiss oeillés de mangérite quartzifère	gneiss oeillés quartzifères	1
23	1	5	d'amphiboles	d'amphibolites	1
25	tab. 2	-	quarts	quartz	1
28	1	3	hornfels	cornéennes	1
29	tab. 5	-	± M.P.-O-HO-Gr	± M.P.-Q-Ho-Gr	1&2
38	-	-	Tab. 8	Voir le tab. 8 ci-joint	1
38	-	-	Tab. 8	See enclosed tab. 8	2
43	-	-	Photos de la Pl. 1 et de la Pl. 2	Voir respectivement photos de la Pl. 3 et de la Pl. 4	1
43	-	-	Photos Pl. 1, Pl. 2	See respectively photos Pl. 3, Pl. 4	2
44	-	-	Photos de la Pl. 3 et de la Pl. 4	Voir respectivement photos de la Pl. 1 et de la Pl. 2	1
44	-	-	Photos Pl. 3, Pl. 4	See respectively photos Pl. 1, Pl. 2	2
50	2	3	micro-oeillés	microglanduleux	1
55	1	7	porphyroblastes	porphyroclastes	1
56	1	1	(Plate 6)	(Plate 16)	2
63	1	3	(2%)	(28)	1
63	1	4	charnockitique.	charnockitique (29 et 30).	1
69	3	6	amphibolites	amphiboles	1
71	1	16	... environnants.	... environnants et les granulites sont rares.	1
73	2	4	(labradorite	(labrador	1

(SUITE)

PAGE	PARAG.	LIGNE *LINE*	A LA PLACE DE/*INSTEAD OF*	LIRE/*READ*	
79	Fig.14	-	Table 25	Table 18	2
83	2	1	GRØGGER	BRØGGER	1
95	1	1 & 10	Binns (1962)	Binns (1964)	1&2
95	2	5 & 7	(1961, p. 372)	(1963, p. 372)	1&2
98	Tab.19	2	Biotite-garnet	Biotite-garnet gneiss	2
112	-	-	Figure 19	Voir Figure 19 ci-joint	1
112	-	-	Figure 19	See enclosed Figure 19	2
115	4	3	Les domaines 1, 5, 6c et 11	Les domaines 1, 5, 6c, 9, 10, 11 et 12	1
115	4	3	Domains 1, 5, 6c and 11	Domains 1, 5, 6c, 9, 10, 11 and 12	2
116	1	2-3	un pli couché	un pli droit	1
116	1	4-5	nord-est et ...	nord-ouest. Un type ...	1
116	1	1	reclined	upright	2
116	1	2-3	northeast and ...	northwest. A similar ...	2
116	1	7	Le domaine 4 illustre ...	Les domaines 4 et 7 illustrent ...	1
116	1	9 à 19	avec un plan axial vertical ... axial orienté vers le nord-est.	à enlever	1
116	1	4	Domain 4 shows	Domains 4 and 7 show	2
116	1	5 à 15	with vertical axis ... in the northeast direction.	delete	2
124	-	-	KLUGMAN, M.A. 1959	KLUGMAN, M.A. 1960	1
124	-	-	Laverdière, C et Courtemanche, A. 3 - Ecoulement Glaciaire et Repention Lacustre;	Laverdière, C et Courtemanche, A. 1965 3 - Ecoulement Glaciaire et Rétentions Lacustres;	1
124	-	-	NOCKOLDS, S.R. & ALLEN, R. 1953	NOCKOLDS, S.R. & ALLEN, R. 1958	2
126	-	-	Sorenson, H. Subramaniem, A.P. Tyrell, G.W.	Sorensen, H. Subramaniam, A.P. Tyrrell, G.W.	2

1 - Français/*French*.
2 - Anglais/*English*.

Tab. 8 - Classification des granulites

Classification of the Granulites

Groupes *Groups*	Types *Types*	Variétés *Varieties*	Feldspath *Feldspar*	Fémiques *Femics*	Microstructure *Microstructure*
Granulites quartzo-feldspathiques *Quartzofeldspathic Granulites*	Alaskitique *Alaskitic*		M.P. > A.P. "	<5%	Microglanduleux et granoblastique *Microflaser and granoblastic*
		Charnockitique *Charnockitic*	" "	Hy	
		Gr- "	"	Hy & Gr	"
		Ox- "	"	Hy & Ox	"
	Grenat/*Garnet*			Gr	"
		Oxide/*oxide*		Gr & Ox	"
	Oxyde/*Oxide*		"	Ox	Micro-oeillé *Microaugen*
Rétrograde *Retrograde*	Biotite *Biotite*		Mi & Olg	Bi	Microglanduleux et granoblastique *Microflaser and granoblastic*
Granulites à hypersthène *Hypersthene Granulites*	Enderbitique *Enderbitic*		A.P. > M.P.		Micro-oeillé *Microaugen*
		Grenat *Garnet*	"		"
	Charnockitique *Charnockitic*	Grenat *Garnet*	M.P. > A.P.	Hy Hy & Gr	
	Hornblende *Hornblende*	Charnockitique *Charnockitic*	M.P. > A.P.	Ho & Hy	"
Rétrograde *Retrograde*	Diopside		Mesoperth.	Di	Microglanduleux et granoblastique *Microflaser and granoblastic*
	Hornblende	Biotite	Mi & Olg	Ho & Bi	
Altéré *Altered*	Chlorite		M.P. A.P.	Chl	"
		Grenat *Garnet*	"	Chl & Gr	"

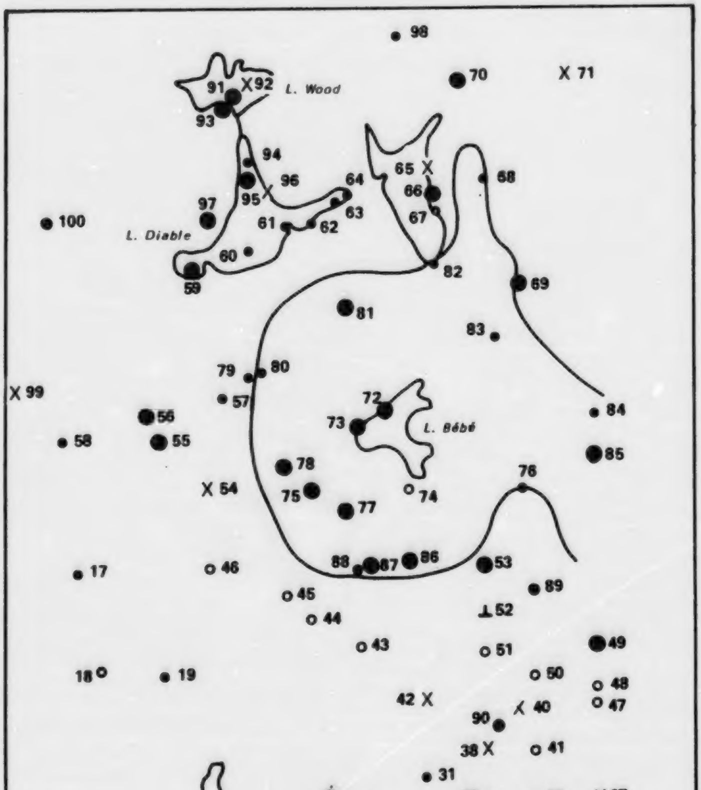
98
70
X 71
91
X92
L. Wood
93
94
96
95
97
64
63
62
61
60
59
L. Diable
100
65 X
66
67
68
82
69
81
83
79
80
57
X 99
56
55
58
72
73
L. Bébé
84
85
76
78
75
77
74
X 54
17
46
88
87
86
53
89
45
44
52
43
51
49
18
19
50
48
47
42 X
X 40
90
38 X
41
31
24
30
36
X 37
29
39
25
28
6
34
21
27
35
16
26
22
33
13
20
32
10
15
14
23
5
4
8
11
12
2
3
X 7
9
1

Figure 19 **Variations dans le métamorphisme. Les cercles ouverts ''PG'', les cercles ''HG'', les points ''A'', les x ''U'' et les ''⊥'' Alt. (voir page 108)**

Variations in metamorphism. Open circles 'PG', full circles, 'HG', dots 'A', x's 'U' and ⊥ 'Alt'. (see page 108)

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THE MINING INDUSTRY

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IN QUEBEC

IN 1963 and 1964

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DEPARTMENT OF NATURAL RESOURCES
QUEBEC
1967

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Honorable Daniel Johnson,
Minister of Natural Resources,
Quebec, Que.

Sir:

I beg to submit herewith the report entitled "The Mining Industry of the Province of Quebec in 1963-1964". This report contains a detailed account of mining operations and statistical data for the years 1963 and 1964.

This report has been prepared by the technical staff of the Department.

The term "production", as used throughout this report, is synonymous with "quantity sold", "shipped" or "used", and does not necessarily represent "annual output".

Unless otherwise noted, the ton specified in the text and tables of this report is that of 2,000 pounds. Values are given in Canadian funds.

As it would be impracticable to mention in this report all those who have contributed to the mineral production of the Province, a list entitled "Repertory of Mining Establishments" is published separately each year by the Quebec Department of Industry and Commerce.

In addition to this annual report on the mining industry, the Department issues a "Department of Natural Resources Annual Report", which deals mostly with administrative matters and covers the fiscal year ending on March 31st.

It also publishes "Geological Reports" with maps, to make public the results of the field work done by geologists of the Department.

Finally, the publication of "Preliminary Reports" often precedes that of the "Geological Reports". Prepared at the end of the field season, these "Preliminary Reports" are issued to render available to the public, within the shortest time possible, the results obtained by geological parties in the field.

Respectfully submitted,
PAUL-E. AUGER,
Deputy Minister,

Department of Natural Resources,
Quebec, February 1967

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THE MINING INDUSTRY

IN QUEBEC

IN 1963 AND 1964

GENERAL REVIEW

Evolution of Production in the Quebec Mining Industry for 1963 and 1964

The reader will find in the present publication a general review of statistical information for 1963 and 1964 relative to the Quebec Mining Industry.

Notwithstanding difficulties encountered in the simultaneous publication of information covering two years, the Mines Branch of the Department of Natural Resources has endeavored to give clear and complete data that would be available to any person who employs, directly or indirectly, statistical figures of the mining industry for economic, social or other purposes.

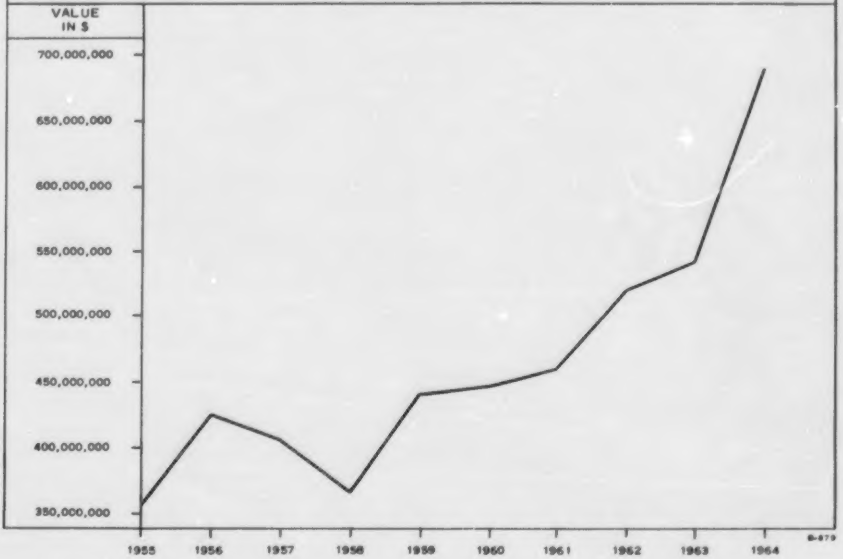
This publication will have a new format owing to the presence of diagrams and of brief commentaries, which follow each table, pertaining to important substances or groups of substances.

In this way, users will be able to obtain, within a minimum of time and in an illustrative and practical manner, complete information including comparisons demonstrating the evident and uninterrupted progress of this key industry that employed more than 34,000 persons in Quebec during 1964.

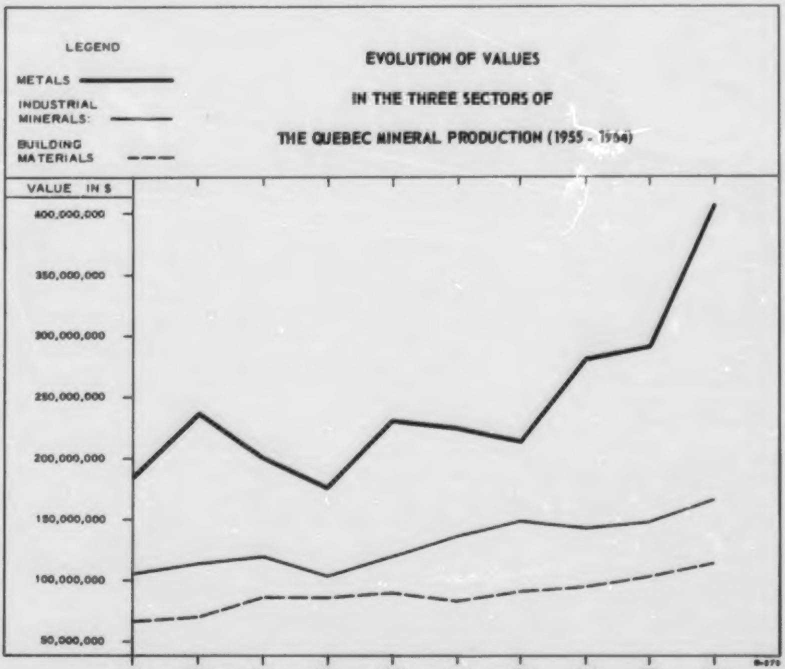
The two principal diagrams that follow show, for a period of ten years (from 1955 to 1964), the spectacular increase in mine production in Quebec. The first gives the total value of production in the mining industry; the second details this value in three groups, namely: metals, industrial minerals, and building materials.

As can be seen in the first diagram the total value of production in 1955 attained $357 million. Ten years later, in 1964, this value had almost doubled and attained approximately $688 million. Moreover (and this constitutes the most interesting and most significant fact), the increase for 1964 over 1963 is truly spectacular representing 27% as compared with 4% for 1963 over 1962.

EVOLUTION OF VALUES IN THE QUEBEC MINERAL PRODUCTIONS (1955 - 1964)



EVOLUTION OF VALUES IN THE THREE SECTORS OF THE QUEBEC MINERAL PRODUCTION (1955 - 1964)



The 1964 increase of 27%, by itself, exceeds the aggregate increase for the four preceding years, which was 22%.

These are, without doubt, indications allowing specialists in mining questions and impartial observers to conclude that this industry is truly prosperous in Quebec.

As a consequence, it may be said that this activity opens up wide prospects for the economy of Quebec as a whole and that it justifies high hopes for the future.

To conclude, the following facts underlining the importance of Quebec among its sister provinces should be mentioned; in the three sectors of Canada's mining industry, Quebec occupied the following positions in 1964:

Second in the Metals group.
First in the Industrial Minerals group.
Second in the Building Materials group.

Table 1. - Annual Value of the Mineral Production in Quebec since 1898

Year	Value	Year	Value	Year	Value
1898	$ 1,673,337	1920	$ 28,392,939	1942	$ 104,404,146
1899	2,083,272	1921	15,522,988	1943	101,840,299
1900	2,546,076	1922	18,335,153	1944	90,198,739
1901	2,987,731	1923	21,326,314	1945	91,570,982
1902	2,985,463	1924	18,952,896	1946	92,213,656
1903	2,772,762	1925	23,824,912	1947	116,042,000
1904	3,023,568	1926	25,740,002	1948	152,285,045
1905	3,750,300	1927	29,124,110	1949	165,168,603
1906	5,019,932	1928	37,325,237	1950	220,665,103
1907	5,391,368	1929	46,454,820	1951	255,931,822
1908	5,458,598	1930	41,158,740	1952	270,739,552
1909	5,552,062	1931	36,051,366	1953	252,354,181
1910	7,323,281	1932	25,683,066	1954	278,932,718
1911	8,679,786	1933	28,164,540	1955	357,562,029
1912	11,187,110	1934	31,310,752	1956	423,003,917
1913	13,119,811	1935	39,141,734	1957	406,488,734
1914	11,732,783	1936	49,755,985	1958	366,001,902
1915	11,465,873	1937	65,203,976	1959	441,299,661
1916	13,287,024	1938	68,877,345	1960	446,637,201
1917	16,189,179	1939	77,312,141	1961	455,522,933
1918	18,707,762	1940	86,418,853	1962	521,327,419
1919	20,813,670	1941	99,700,027	1963	542,169,274
				1964	687,666,579

Table 2 - Mineral Production of Quebec in 1963 and 1964
(Final figures)

SUBSTANCE		1964		1963	
		Quantity	Value	Quantity	Value
METALLICS					
Bismuth	pounds	175,157	$ 320,826	201,961	$ 355,197
Cadmium	pounds	236,487	766,218	43,546	104,510
Cobalt	pounds	86,091	185,957	90,289	175,160
Columbium	pounds	2,163,359	2,282,522	1,393,444	1,300,009
Copper	pounds	316,176,181	105,602,844	282,799,924	89,081,976
Gold	ounces	934,769	(a) 35,287,530	917,229	(a) 34,625,395
Iron	tons	429,383	18,700,185	221,241	9,246,713
Iron (ore) (b)	tons	15,512,916	161,880,175	11,650,787	122,800,862
Lead	pounds	7,908,961	1,062,964	8,673,195	954,051
Molybdenum	pounds	1,185,074	1,991,294	833,867	1,344,004
Nickel	pounds	4,677,108	3,928,771	5,011,649	4,209,785
Selenium	pounds	279,834	1,357,195	286,042	1,387,304
Silver	ounces	4,564,558	6,390,381	4,441,644	6,147,235
Tellurium	pounds	64,063	416,409	64,590	419,835
Titaniferous iron	tons	24,970	237,603	26,426	247,667
Zinc	pounds	473,080,673	67,035,531	150,168,758	19,191,567
Sub-totals		- - -	$ 407,446,405	- - -	$ 291,591,270
NON-METALLICS					
1. - Industrial Minerals					
Asbestos	tons	1,285,564	$ 124,923,453	1,158,209	$ 116,582,134
Feldspar	tons	9,149	212,052	8,608	197,031
Industrial lime	tons	334,739	3,764,737	319,888	4,156,393
Industrial limestone and marble	tons	1,204,500	3,130,063	974,648	2,702,598
Lithium	pounds	1,056,408	1,155,282	644,354	682,029
Magnesitic dolomite and brucite		- - -	3,569,619	- - -	3,439,890
Marl	tons	84,487	147,852	42,736	74,788
Mica	pounds	765,814	79,608	838,056	38,450
Ochre and iron oxide	tons	1,033	79,250	978	74,505
Peat (moss and humus)	tons	84,127	2,205,054	87,762	2,245,614
Quartz and industrial sand	tons	459,195	2,692,249	401,063	2,266,273
Soapstone and talc	tons	17,256	199,049	15,560	175,013
Sulfur	tons	226,161	1,470,591	262,893	1,829,316
Titanium dioxide and other titanium products	tons	379,925	21,270,144	255,509	13,806,608
Sub-totals		- - -	$ 164,899,003	- - -	$ 148,270,642
2. - Building materials					
Building lime	tons	34,315	$ 357,928	38,313	$ 430,100
Building limestone	tons	30,437,827	29,827,782	24,361,684	26,189,306
Building marble	tons	28,775	212,981	11,578	125,279
Cement	tons	2,628,841	41,590,355	2,330,641	36,938,775
Clay products Brick	M	121,841	5,174,970	119,109	5,212,212
Other products		- - -	1,664,802	- - -	1,647,232
Granite	tons	5,216,601	10,829,849	3,126,135	8,547,938
Sand and gravel	tons	47,907,486	22,207,399	43,654,884	21,213,905
Sandstone	tons	2,103,473	2,603,985	1,770,083	1,981,987
Slate and shale	tons	1,131,955	851,120	40,849	20,628
Sub-totals		- - -	$ 115,321,171	- - -	$ 102,307,362
TOTALS			$ 687,666,579		$ 542,169,274

(a) Value in Canadian funds. The standard value at the rate of $20.671834 per ounce troy is $19,323,390 for 1964 and $18,960,806 for 1963.

(b) In view of the uncertainty as to the boundary line between Quebec and Newfoundland, it is possible that this does not represent all the production of the Province of Quebec.

Table 3. - Mineral Production of Quebec, 1944 to 1964 (a)

Year	Metals		Industrial Minerals		Building Materials		Total
	Value	%	Value	%	Value	%	
1944	$ 51,520,713	57	$ 26,763,353	30	$ 11,914,673	13	$ 90,198,739
1945	48,082,817	52	29,045,463	32	14,442,702	16	91,570,982
1946	40,602,170	44	31,573,378	34	20,038,108	22	92,213,656
1947	50,159,626	43	39,792,717	34	26,089,657	23	116,042,000
1948	66,103,854	44	50,749,672	33	35,431,519	23	152,285,045
1949	82,728,089	50	47,173,969	29	35,266,545	21	165,168,603
1950	108,897,715	49	73,128,980	33	38,638,408	18	220,665,103
1951	120,257,513	47	89,010,161	35	46,664,148	18	255,931,822
1952	120,283,133	44	97,233,834	36	53,222,585	20	270,739,552
1953	103,278,622	41	96,392,456	38	52,683,103	21	252,354,181
1954	128,582,455	46	94,092,032	34	56,475,399	20	278,932,718
1955	184,680,850	52	105,890,962	29	66,990,217	19	357,562,029
1956	237,763,816	56	114,939,075	27	70,301,026	17	423,003,917
1957	200,853,044	49	120,606,214	30	85,029,476	21	406,488,734
1958	176,695,307	48	104,372,724	29	84,933,871	23	366,001,902
1959	232,555,994	53	119,650,112	27	89,093,555	20	441,299,661
1960	224,355,382	50	136,235,367	31	85,046,452	19	446,637,201
1961	214,387,232	47	150,070,187	33	91,065,514	20	455,522,933
1962	281,448,234	54	143,695,273	27	96,183,912	19	521,327,419
1963	291,591,270	54	148,270,642	27	102,307,362	19	542,169,274
1964	407,446,405	60	164,899,003	24	115,321,171	16	687,666,579

(a) Mineral production figures for the years prior to 1944 will be found in "Mining Industry of the Province of Quebec in 1962". For the years prior to 1930, figures will be found in the 1956 publication.

Prospecting and Staking of Mining Claims in 1963 and 1964

Figures appearing in Table 4 show that for the year 1963 there was a decrease in the number of miner's certificates issued and of mining claims registered. On the other hand, the Department issued or renewed an almost equal number of development licenses compared with that of the preceding year. The increase registered in the domain of exploration in 1964 was the result of the opening to staking of Gaspesian Park on November 1, 1963.

An appreciable increase over the amount for the preceding year in exploration and development work was noted in 1963, as well as in 1964.

Table 4. - Mining Titles Issued, or Renewed, from 1955 to 1964

Year	Miner's Certificates Issued	Claims Recorded	Development Licenses Issued	Development Licenses Renewed	Mining Concessions Granted
1955	17,781	49,000	2,872	5,890	11
1956	16,746	55,523	3,869	6,552	8
1957	14,770	49,084	2,939	6,868	6
1958	16,225	52,550	3,560	6,222	11
1959	11,361	42,777	3,539	6,349	9
1960	8,413	25,916	6,785	1,595	13
1961	11,153	34,557	2,074	6,291	11
1962	9,208	37,069	1,334	6,016	10
1963	8,917	26,016	1,487	5,812	11
1964	11,130	36,310	1,997	6,121	11

Table 5. - Exploratory Work on Claims and Lands under License, Reported for the Years 1955 to 1964

Year	Number Working Days	Number of Feet of Drilling
1955	1,107,712	417,144
1956	2,338,452	1,321,429
1957	2,298,128	1,511,580
1958	1,335,888	624,104
1959	1,599,072	741,907
1960	1,251,048	730,225
1961	1,065,109	593,715
1962	980,732	587,438
1963	1,022,390	643,549
1964	1,396,498	932,519

Table 6 - Base-metal Ore-dressing Plants

Plant	Township or Parish	Daily Capacity (Tons)	Metals Produced (a)											
			Cu	Fe	Pb	Zn	Ni	Mo	Bi	Li	Py	Au	Ag	Cb
Campbell Chibougamau Mines Ltd.	Obalski	3,300	X									X	X	
Coniagas Mines Ltd., The	Lesueur	350			X	X							X	
Gaspé Copper Mines Ltd.	Holland	6,500	X					X	X			X	X	
Hilton Mines, The	Bristol	3,000		X										
Lake Dufault Mines Ltd.	Dufresnoy	1,300	X			X						X	X	
Lorraine Mining Company Ltd.	Gaboury	400	X				X					X	X	
Manitou-Barvue Mines Ltd.	Bourlamaque	1,300	X		X	X						X	X	
Marbridge Mines Ltd. ..	LaMotte	400	X				X							
Mattagami Lake Mines Ltd.	Galinée	3,500	X			X						X	X	
Merrill Island Mining Corporation Limited ..	Obalski	650	X									X	X	
Molybdenite Corporation of Canada Limited	Lacorne	950						X	X					
New Calumet Mines Ltd..	Grand-Calumet	750			X	X						X	X	
Noranda Mines Ltd.	Rouyn	4,000	X								X	X	X	
Normetal Mining Corporation Ltd.	Desmeloizes	1,000	X			X					X	X	X	
Opemiska Copper (Quebec) Mines Limited	Lévy	2,000	X									X	X	
Orchan Mines Limited ..	Galinée	1,900	X			X						X	X	
Patino Mining Corporation, The	McKenzie	1,500	X									X	X	
Preissac Molybdenite Mines Limited	Preissac	1,200						X	X					
Quebec Cartier Mining Limited	Conan	25,650		X										
Quebec Lithium Corporation	La Corne	1,800								X				
Quemont Mining Corporation Ltd.	Rouyn	2,300	X			X					X	X	X	
St. Lawrence Columbium and Metals Corporation	Oka	1,000												X
Solbec Copper Mines, Ltd.	Stratford	1,400	X		X	X						X	X	
Sullico Mines Limited .	Bourlamaque	2,500	X									X	X	
Vauze Mines Limited ...	Dufresnoy	350	X			X							X	
Total daily capacity in 1964		69,000												

(a) Symbols used mean: Cu, copper; Fe, iron; Pb, lead; Zn, zinc; Ni, nickel; Mo, molybdenum; Bi, bismuth; Li, lithium; Py, pyrite; Au, gold; Ag, silver, Cb, columbium.

Table 7 - Capital Expenditures of the Principal Mine Operators in Quebec in 1964

(a) Total cost of all work performed by operators of non-producing mining properties

(b) Capital expenditures of operators of producing mines

Substances	Non-producing Mines (a)	Producing Mines (b)	Total Capital Expenditures
Asbestos	$ 777,015	$ 9,765,646	$ 10,542,661
Columbium	45,910	171,922	217,832
Copper	7,615,604	4,379,265	11,994,869
Feldspar and quartz	144,272	237,659	381,931
Iron	627,473	14,401,399	15,028,872
Titaniferous iron	49,480	844,244	893,724
Lithium	- - -	140,686	140,686
Magnesite and brucite	- - -	222,533	222,533
Molybdenite	1,991,446	1,659,254	3,650,700
Nickel	1,616,632	892,312	2,508,944
Gold	6,954,534	953,727	7,908,261
Petroleum	808,241	- - -	808,241
Peat	- - -	138,699	138,699
Zinc and lead	364,879	4,433,601	4,798,480
Others	60,543	24,188	84,731
Total	$ 21,056,029	$ 38,265,135	$ 59,321,164
Total 1963	$ 17,484,751	$ 43,596,430	$ 61,081,181
Total 1962	$ 20,595,279	$ 37,611,451	$ 58,206,730
Total 1961	$ 40,899,093	$ 23,810,713	$ 64,709,806
Total 1960	$ 59,766,472	$ 24,513,580	$ 84,280,052
Total 1959	$ 50,081,772	$ 21,899,347	$ 71,981,119
Total 1958	$ 25,443,631	$ 36,255,597	$ 61,699,228
Total 1957	$ 65,152,480	$ 37,779,380	$ 102,931,860
Total 1956	$ 36,806,688	$ 22,558,379	$ 59,365,067
Total 1955	$ 23,102,904	$ 38,147,556	$ 61,250,460
Total 1954	$ 31,734,836	$ 37,908,892	$ 69,643,728
Total 1953	$ 24,532,595	$ 23,668,780	$ 48,201,375
Total 1952	$ 20,982,184	$ 27,665,732	$ 48,647,916
Total 1951	$ 12,263,402	$ 19,708,780	$ 31,972,182

Table 8 - Dividends Paid by Companies Operating Metal Mines in Quebec, from 1930 to 1964, Inclusive

These dividends should not be regarded as entirely derived from mining operations of companies listed. The revenue of some of these companies includes interest and dividends on investments, and in certain cases it forms an important part.

Company	Authorized Capital (Shares)	Date of First Dividends	Dividends in 1964		Total Dividends (To end of 1964) $
			Total $	Rate Per Share $	
Anacon Lead Mines Limited	6,500,000	Jan. 29th, 1952	....	......	1,050,000.00
Beattie Gold Mines Limited	5,000,000	June 1st, 1936	....	......	1,438,481.20
Beattie Gold Mines (Quebec) Ltd. ...	5,000,000	Aug. 15th, 1939	....	......	2,996,541.44
Belleterre Quebec Mines Ltd.	1,500,000	Sept. 15th, 1945	....	......	6,375,000.00
Canadian Malartic Gold Mines Ltd. ..	4,000,000	Sept. 8th, 1937	....	......	3,120,683.55
Coniagas Mines Ltd. (The	3,000,000	Jan. 31st, 1962	....	......	159,300.00
East Malartic Mines Limited	4,000,000	June 1st, 1940	....	......	3,440,000.00
East Sullivan Mines Limited .... (a)	4,500,000	May 25th, 1950	....	......	19,066,750.00
Elder Mines Limited	3,000,000	June 15th, 1951	....	......	219,524.40
Francoeur Mines Limited	6,000,000	Dec. 20th, 1940	....	......	208,833.31
Gaspé Copper Mines Ltd.	3,000,000	Dec. 10th, 1963	3,180,000.00	1.20	3,975,000.00
Golden Manitou Mines Limited	3,500,000	Oct. 1st , 1948	....	......	2,550,005.95
Hastings Mining and Development Co. Ltd.	5,000,000	July 10th, 1964	2,250,000.00	0.45	2,250,000.00
Hollinger North Shore Exploration Co. Ltd.	3,000,000	Dec. 28th, 1959	1,577,143.75	0.65	47,923,093.75
Iron Ore Company of Canada ..... (c)	6,000,000	Dec. 28th, 1962	16,271,320.00	2.90	48,682,640.00
Lake Dufault Mines Limited	5,000,000	Jan. 20th, 1942	....	......	1,310,556.00
Lamaque Mining Co. Ltd.	1,500,000	" " 1939	....	......	25,129,529.22
McWatters Gold Mines Limited	5,000,000	Dec. 18th, 1935	....	......	653,577.10
Malartic Gold Fields Limited	4,000,000	Aug. 1st , 1941	....	......	2,000,000.00
Marbridge Mines Ltd.	3,000,000	April 25th, 1964	1,095,000.00	0.36 1/2	1,095,000.00
New Calumet Mines Limited	5,000,000	Jan. 14th, 1949	....	......	3,259,888.97
New Senator-Rouyn Ltd.	5,000,000	Feb. 20th, 1943	....	......	102,249.99
Noranda Mines Limited	12,000,000	Jan. 2nd, 1930	14,525,599.30	1.45	280,908,199.78
Normetal Mining Corporation Ltd. ...	4,000,000	June 24th, 1946	1,127,103.60	0.30	25,209,550.52
O'Brien Gold Mines Ltd.	4,000,000	Feb. 1st, 1939	....	......	2,925,000.00
Opemiska Copper Mines (Quebec) Ltd..	6,000,000	Dec. 30th, 1960	3,033,250.00	0.55	8,548,250.00
Patino Mining Corp. (The	5,000,000	Nov. 16th, 1962	730,500.00	0.20	1,708,065.00
Perron Gold Mines Limited	5,000,000	Dec. 21st, 1938	....	......	2,820,000.00
Powell Rouyn Gold Mines Limited	3,000,000	Oct. 16th, 1939	....	......	425,000.00
Quemont Mining Corporation Ltd.	2,500,000	Dec. 28th, 1951	2,102,168.00	1.00	36,893,048.40
Sigma Mines Limited	3,000,000	Sept. 1st, 1937	....	......	30,000.00
Sigma Mines (Quebec) Limited	1,000,000	July 27th, 1940	300,000.00	0.30	10,625,000.00
Siscoe Mines Ltd. .... (b)	5,000,000	March 31st, 1932	....	......	8,650,408.86
Stadacona Mines (1944) Limited	5,000,000	Feb. 16th, 1948	....	......	1,075,293.48
Sullico Mines Limited	5,000,000	Dec. 12th, 1961	1,408,000.00	0.32	3,256,000.00
Sullivan Consolidated Mines Ltd. ...	4,000,000	June 15th, 1937	600,000.00	0.15	10,480,000.00
Vauze Mines Ltd.	5,000,000	May 22nd, 1963	....	......	183,000.00
Waite Amulet Mines Limited	3,500,000	July 15th, 1940	198,000.00	0.06	102,168,000.00
Total			48,398,084.65		672,911,470.92

(a) From the end of 1960, its dividends are no longer considered as derived from direct mining operations.

(b) From the end of 1951, its dividends are no longer considered as derived from direct mining operations.

(c) Mines operated in Quebec and Newfoundland.

PRICE OF METALS

Although in each commentary information has been given, when available, on the average price of the metal concerned, it has been thought advisable to show, as additional data, in the following table, variations in these prices during the past six years, namely from 1959 to 1964 inclusive.

Table 9 - Average Price of Some Metals in Canada from 1959 to 1964

	1959	1960	1961	1962	1963	1964
Gold, dollars per ounce troy ..	33.57	33.95	35.46	37.41	37.75	37.75
Silver, cents per ounce troy ..	87.78	88.91	94.26	116.50	138.40	140.00
Copper, cents per pound	29.61	30.29	29.19	31.00	31.50	33.40
Lead, cents per pound	10.61	10.68	10.21	9.92	11.00	13.44
Zinc, cents per pound	12.24	13.35	12.59	12.10	12.78	14.17
Selenium, dollars per pound ...	7.00	7.00	6.50	5.75	4.85	4.85
Tellurium, dollars per pound ..	2.15	3.50	4.85	6.00	6.50	6.50

METALLIC SUBSTANCES

BISMUTH

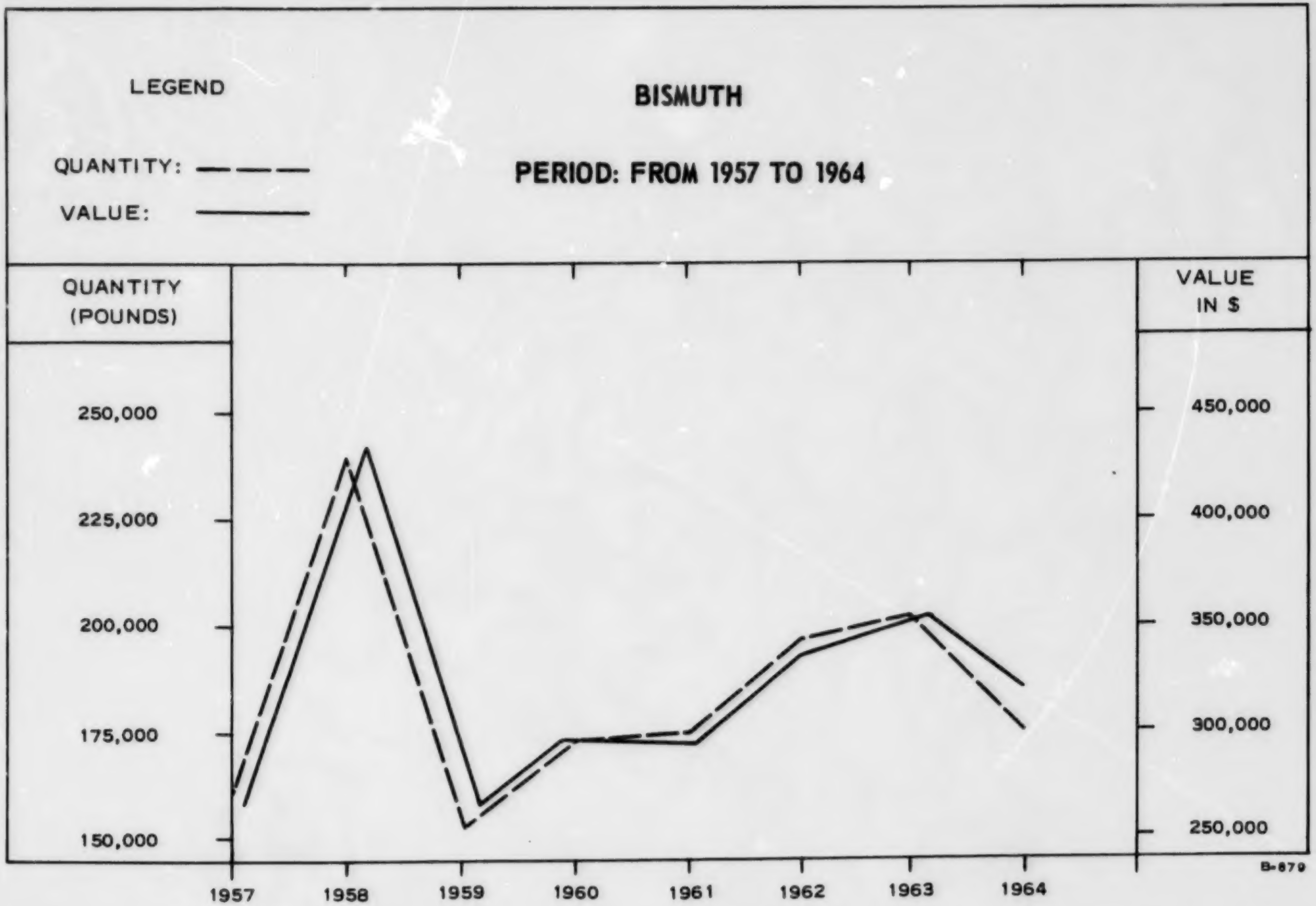
Production of bismuth in Quebec attained its apex in 1958 with 240,177 pounds. A slight drop was registered during the years following and production was 201,961 pounds in 1963 and 175,157 pounds in 1964.

In spite of this slight drop Quebec production represented 56.27% in 1963, and 45.02% in 1964, of the country's production for these two years.

Bismuth is used as an alloy with zinc, lead and tin; it is also used in the manufacture of pharmaceutical products, cosmetics and pigments.

Table 10 - Production of Bismuth in Quebec, from 1957 to 1964

Year	Quantity (Pounds)	Value	Year	Quantity (Pounds)	Value
1957	160,093	$ 267,908	1961	174,832	$ 297,670
1958	240,177	436,420	1962	196,501	336,094
1959	151,576	264,228	1963	201,961	355,197
1960	172,983	297,108	1964	175,157	320,826



BISMUTH

PERIOD: FROM 1957 TO 1964

CADMIUM

In 1960, cadmium figured for the first time on the list of mineral substances produced in Quebec with a production of 66,499 pounds. It did not appear on the list in 1961 but, during the years that followed, appeared in the list with important production totals. The output amounted to only 66,293 pounds in 1962 and to 43,546 pounds in 1963 but, during 1964, it reached 236,487 pounds, which represents about four times the 1962 figure and six times the 1963 figure.

Cadmium is recovered from zinc ores and, to a lesser degree, from lead ores. It is widely used in industry for rust-proofing iron and steel and as an alloy with copper and other metals. Its many uses explain why cadmium is in such demand and why it is the object of much interest.

Its price fluctuated frequently during 1963 and 1964. In the United States cadmium cost $1.70 early in 1963; after several increases it attained $3.05 a pound in early 1964.

Quebec ranks second to British Columbia in the production of cadmium in Canada.

Table 11 - Production of Cadmium in Quebec from 1960 to 1964

Year	Quantity (Pounds)	Value
1960	66,499	$ 94,429
1961	- -	- -
1962	66,293	114,024
1963	43,546	104,510
1964	236,487	766,218

COBALT

Cobalt, which appeared for the first time in 1963 on the list of mineral substances of Quebec, is a metal in great demand for the special qualities it gives to other metals when alloyed with them. Uses of this metal are numerous and varied. It constitutes the greatest portion of alloys for permanent magnets and its uses in the chemical industry are highly varied.

Today the most important of its utilizations is without doubt the "cobalt-60 radioisotope" for radiographic examinations and the cobalt bomb, which is widely used in cancer treatment.

No cobalt ore as such is mined in Quebec or in the rest of Canada. This metal is recovered as a by-product from the smelting and refining of nickel-copper ores and sometimes also from the refining of silver.

In 1963 Quebec produced 90,289 pounds of cobalt valued at $175,160; in 1964, the Province produced 86,091 pounds valued at $185,957.

COLUMBIUM

Quebec possesses the only columbium ore deposit in Canada and even in the world. True, other countries also produce columbium but only as a by-product of the mining of tin. St. Lawrence Columbium and Metals Corporation, which mines the Quebec deposit, produces concentrates with an average tenor of 51,76% Cb_2O_5.

An increase in the uses of columbium in metallurgy is noted daily throughout the world. The addition of this metal to carbide steels increases their strength, notably those used in the manufacture of oil and gas pipelines.

As can be seen in the table that follows the production of this metal was 1,016,515 pounds in 1962; 1,393,444 pounds in 1963, and 2,163,359 pounds in 1964. Increases are regular and important: a rise in 1963 of 37.11% over the 1962 production and 55.28% in 1964 over that of 1963.

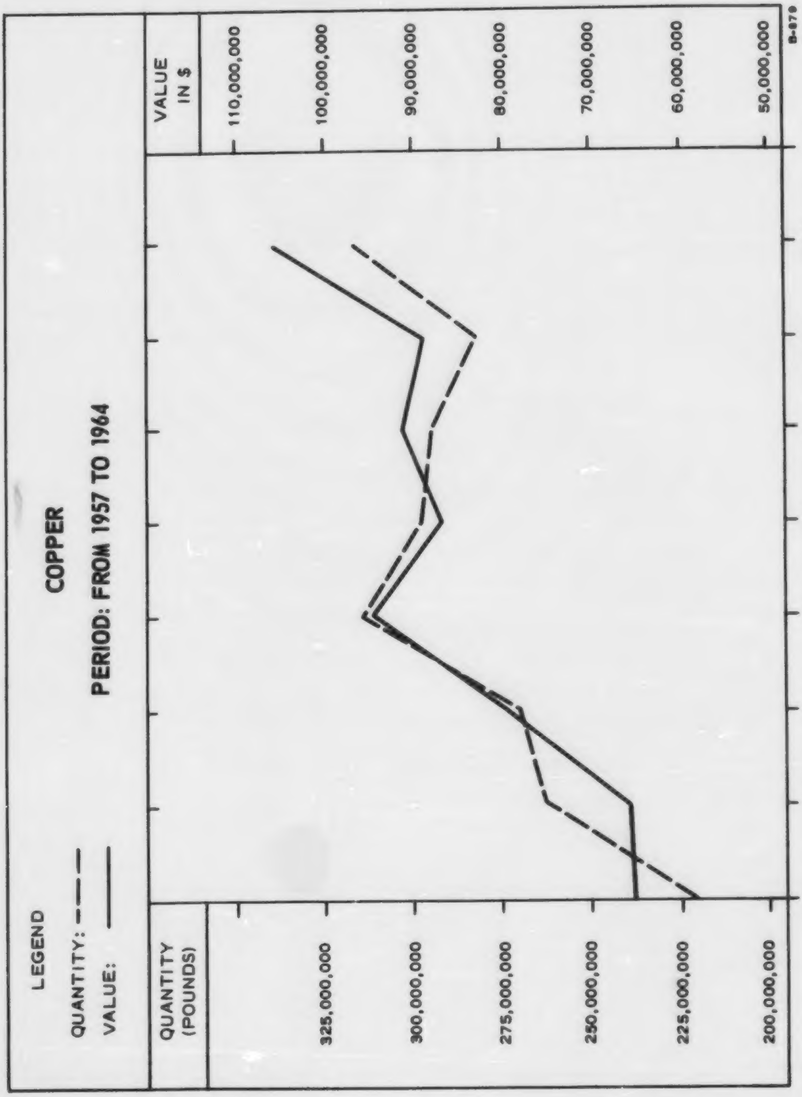
According to approximate estimates by St. Lawrence Columbium and Metals Corporation, ore reserves on the prospected part of its property amount to 62 million tons of pyrochlore containing about 500 million pounds of columbium metal.

In view of the foregoing it is easy to see that Quebec ranks first in Canada and in the world for the production of columbium proper.

Table 12 - Production of Columbium in Quebec from 1961 to 1964

Year	Quantity (Pounds)	Value	Year	Quantity (Pounds)	Value
1961	62,229	$ 65,619	1963	1,393,444	$1,300,009
1962	1,016,515	958,359	1964	2,163,359	2,282,522

COPPER


COPPER
PERIOD: FROM 1957 TO 1964
LEGEND
QUANTITY: – – –
VALUE: ——
QUANTITY (POUNDS)
325,000,000
300,000,000
275,000,000
250,000,000
225,000,000
200,000,000
VALUE IN $
110,000,000
100,000,000
90,000,000
80,000,000
70,000,000
60,000,000
50,000,000
1957
1958
1959
1960
1961
1962
1963
1964
B-879

The increase in the production of copper in Quebec has remained steady. It attained 316 million pounds in 1964, an 11.66% increase over the preceding year's production, which was 283 million pounds.

Quebec thus ranks second to Ontario in the production of this metal in Canada, and its production represents 32.44% of the Canadian total.

The ancients were cognizant of the uses of this metal. Today its utilization is most widespread in every domain of the industry. Its properties are such that researchers never cease to discover new uses for this metal.

As in production and consumption, the average price of copper increased from 31.00 cents in 1962, to 31.50 cents in 1963, reaching 33.40 cents a pound in 1964.

Table 13- Production of Copper in Quebec from 1957 to 1964

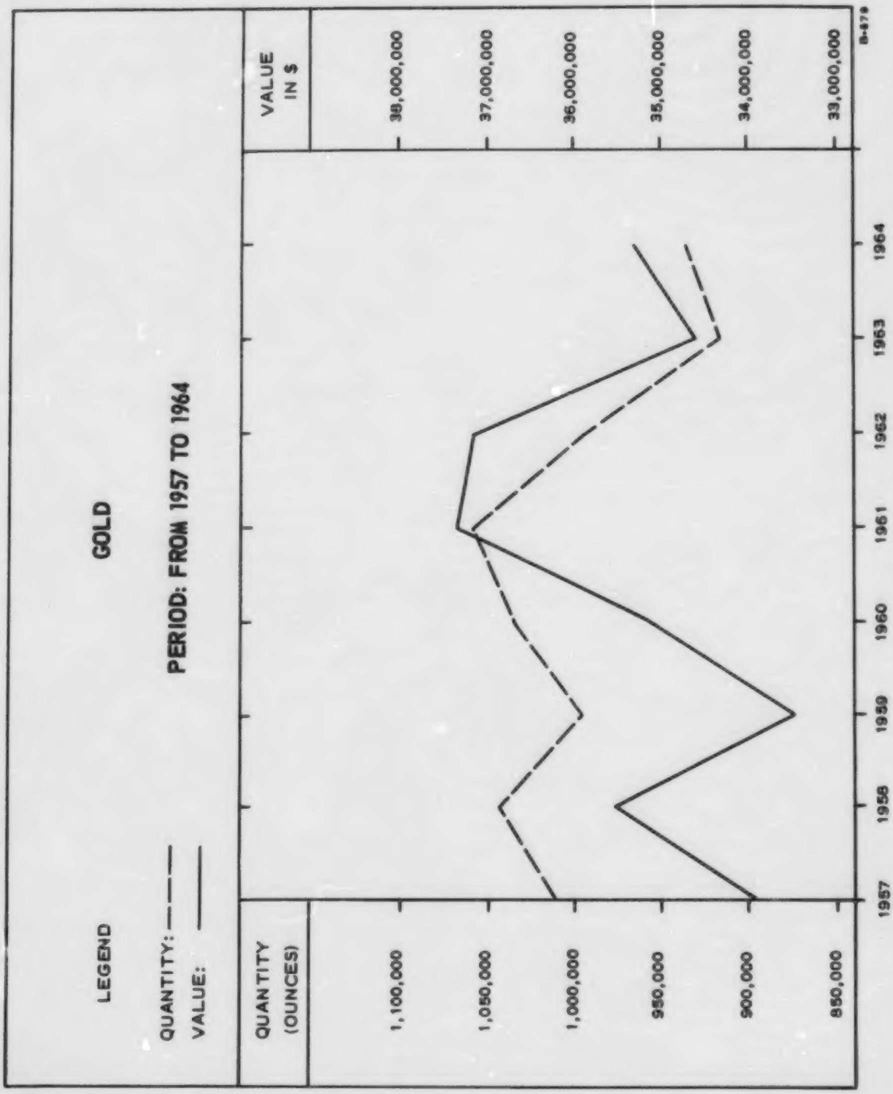
Year	Quantity (Pounds)	Value	Year	Quantity (Pounds)	Value
1957	224,818,449	$ 65,084,491	1961	298,013,711	$ 86,990,202
1958	262,890,590	66,826,788	1962	294,866,235	91,408,533
1959	269,823,777	79,894,820	1963	282,799,924	89,081,976
1960	314,939,446	95,395,158	1964	316,176,181	105,602,844

GOLD

Gold is one of the principal natural resources of Quebec's subsoil.

This precious metal, so highly regarded for its beauty and its glitter, was used in the past as it is today in the manufacture of jewels and for ornamental purposes.

Its main use today is in the monetary reserves of states and banks for the stabilization of paper money and for maintaining the balance of international trade.


LEGEND
QUANTITY: ----
VALUE: ——
GOLD
PERIOD: FROM 1957 TO 1964
QUANTITY (OUNCES)
1,100,000
1,050,000
1,000,000
950,000
900,000
850,000
VALUE IN $
38,000,000
37,000,000
36,000,000
35,000,000
34,000,000
33,000,000
1957
1958
1959
1960
1961
1962
1963
1964

In addition to being used in jewellery because of its good appearance, gold also has multiple other qualities favoring its uses in virtually every field. It enters into the manufacture of chemical products and is used in dentistry,in glass-making, in textiles and even in missiles such as Telstar, the first television satellite.

It is superior to other metals because of its dominant properties such as resistance to corrosion, high density (19.3) and low specific heat.

In 1964 a good portion of the gold produced in Quebec (518,531 ounces troy, or over 55%) came from gold-bearing quartz ores treated in nine plants in Bourlamaque, Fournière, Louvicourt, McKenzie and Dubuisson townships. The total daily capacity of these nine ore-dressing plants was 10,150 tons during 1964. The remainder of the production came from complex ores (that is to say, ores containing other substances with high or low tenors, such as copper and, also quite frequently, lead and zinc).

With a production of 934,769 ounces of gold in 1964, Quebec ranked second in importance among the provinces of Canada and its share represented 24.37% of the total production of the country. In 1963, the Quebec production was 917,223 ounces; it already held second rank and its share was 22.91% of Canada's total production.

The average price of gold, which was $37,41 per ounce troy, increased to $37.75 in 1963 and 1964.

Table 14 - Gold-bearing Ore-dressing Plants (a)

Plant	Township	Maximum Daily Capacity (Tons)
Barnat Mines Limited	Fournière	600
Bevcon Mines Limited	Louvicourt	800
Canadian Malartic Gold Mines Limited	Fournière	1,300
East Malartic Mines Limited	Fournière	1,500
Lamaque Mining Company Limited	Bourlamaque	2,000
Malartic Gold Fields Limited	Fournière	1,800
Norbeau Mines Limited	McKenzie	200
Sigma Mines Limited	Bourlamaque	1,200
Sullivan Consolidated Mines Limited	Dubuisson	750
Total daily capacity in 1964		10,150

a) All these plants also produce silver.

Table 15 - Production of Gold in Quebec, 1955-1964

Year	Gold-bearing Quartz Ore Mines (Tons)	Gold-bearing Quartz Mines		Complex-ore Mines*		Total Gold Shipped	
		Gold Shipped		Gold Shipped			
		Quantity (Ounces)	Value	Quantity (Ounces)	Value	Quantity (Ounces)	Value
1955	4,803,810	770,604	$ 26,601,250	385,814	$ 13,318,299	1,156,418	$ 39,919,549
1956	3,931,831	628,699	21,658,681	408,361	14,068,036	1,037,060	35,726,717
1957	3,703,231	613,080	20,568,834	397,192	13,325,792	1,010,272	33,894,626
1958	3,872,805	625,258	21,246,267	419,025	14,238,469	1,044,283	35,484,736
1959	3,750,990	599,574	20,127,170	397,520	13,345,276	997,094	33,472,446
1960	3,998,027	617,605	20,967,690	415,467	14,105,104	1,033,072	35,072,794
1961	4,137,099	631,198	22,382,281	422,831	14,993,587	1,054,029	37,375,868
1962	4,046,000	580,727	21,724,997	413,222	15,458,635	993,949	37,183,632
1963	3,618,481	516,653	19,503,651	400,576	15,121,744	917,229	34,625,395
1964	3,659,624	518,810	19,585,078	415,959	15,702,452	934,769	35,287,530

* Also producing base metals.

Table 16a - Gold Production of Mines in Quebec during 1963

Property	Year of First Production	Ore Raised (Tons)	Ore Treated (Tons)	Gold (fine) Shipped (Ounces)	See Footnote
Gold Mines					
Akasaba	1960	31,184	31,184	4,007	(b)
Barnat	1938	575,215	575,555	62,304	(b)
Bevcon	1947	248,450	248,450	28,459	(b)
Canadian Malartic	1935	330,175	330,434	27,467	(b)
East Malartic	1938	507,003	507,003	74,472	(b)
Lamaque	1935	767,590	767,590	123,407	(b)
Malartic Gold Fields ...	1939	146,800	146,800	22,018	(b)
Malartic Hygrade	1962	13,877	6,396	2,263	(b)
Marban	1961	142,269	142,269	24,197	(b)
Norlartic	1959	163,087	163,087	21,755	(b)
Peel Elder	1946	17,608	17,297	2,253	(c)
Sigma	1937	423,058	423,058	75,929	(b)
Sullivan Consolidated ..	1934	290,366	258,348	47,146	(b)
Other mines				976	
Total:		3,657,222	3,617,471	516,653	
Base-metal Mines (1)					
Campbell Chibougamau ...	1955	833,286	833,286	27,726	(c)
Coniagas	1961	116,074	111,418	1,198	(c)
Gaspé Copper	1955	2,785,489	2,770,393	2,420	(c)
Manitou Barvue	1942	467,365	467,365	8,922	(b) (c)
Mattagami Lake	1963	245,236	166,725	833	(c)
Merrill Island	1958	143,087	143,087	2,740	(c)
New Calumet	1943	93,126	93,360	1,374	(c)
New Hosco	1963				(c)
Noranda	1927	1,343,854	1,534,279	193,636	(c)
Normetal	1937	345,384	345,384	5,952	(c)
Opemiska	1954	739,350	737,543	16,725	(c)
Orchan Mines	1963	86,342	35,956	117	(c)
Patino	1959	675,730	675,730	33,208	(c)
Quemont	1949	803,003	803,003	98,826	(b) (c)
Solbec	1962	201,376	188,493	1,290	(c)
Sullico	1949	1,007,046	1,007,046	3,524	(c)
Vauze	1961	121,898	115,878	2,085	(c)
Total:		10,007,646	10,028,946	400,576	
GRAND TOTAL:		13,664,868	13,646,417	917,229	

(b) Cyanidation; (c) Smelter

(1) Ores of these mines are complex and base metals and silver are also produced.

Table 16b - Gold Production of Mines in Quebec

during 1964

Property	Year of First Production	Ore Raised (Tons)	Ore Treated (Tons)	Gold (fine) Shipped (Ounces)	See Footnote
Gold Mines					
Barnat	1938	581,796	581,266	62,749	(b)
Bevcon	1947	242,085	242,085	30,143	(b)
Canadian Malartic	1935	332,151	329,388	31,735	(b)
East Malartic	1938	470,122	470,122	70,412	(b)
Lamaque	1935	768,280	768,280	122,080	(b)
Malartic Gold Fields ...	1939	122,771	122,771	13,455	(b)
Marban	1961	157,872	157,872	23,729	(b)
Norbeau Mines	1964	22,983	22,983	9,949	(b)
Norlartic	1959	165,596	165,596	19,919	(b)
Peel Elder	1946	108,932	105,719	12,456	(c)
Sigma	1937	439,134	439,134	77,832	(b)
Sullivan Consolidated ..	1934	290,799	253,510	43,847	(b)
Other mines				504	
Sub-totals		3,702,521	3,658,726	518,810	
Base-metal Mines (1)					
Campbell Chibougamau ...	1955	896,706	896,706	29,226	(c)
Coniagas	1961	119,618	114,459	773	(c)
Gaspé Copper	1955	2,834,051	2,803,206	1,968	(c)
Lake Dufault	1964	139,956	139,956	3,288	(c)
Manitou Barvue	1942	387,905	387,905	14,136	(b) (c)
Mattagami Lake	1963	1,183,654	1,282,072	6,196	(c)
Merrill Island	1958	134,026	134,026	2,996	(c)
New Calumet	1943	96,275	95,605	1,249	(c)
Noranda	1927	1,452,114	1,452,363	207,970	(c)
Normetal	1937	348,924	348,924	4,946	(c)
Opemiska	1954	728,570	748,990	16,457	(c)
Orchan Mines	1963	324,032	369,272	3,100	(c)
Patino	1959	817,355	674,137	34,059	(c)
Quemont	1949	752,691	752,691	82,157	(b) (c)
Solbec	1962	424,127	424,127	2,399	(c)
Sullico	1949	988,023	988,023	3,461	(c)
Vauze	1961	126,464	125,965	967	(c)
Other mines				611	
Sub-totals		11,754,491	11,738,427	415,959	
GRAND TOTAL		15,457,012	15,397,153	934,769	

(b) Cyanidation; (c) Smelter

(1) Ores of these mines are complex and base metals and silver also are produced.

IRON

Although iron is the cheapest of all metals it nevertheless stands first in the order of necessities in our industrial world.

This metal is the source of steel, a most precious alloy, which constitutes the framework of most of the imposing realizations by our present-day builders.

Steel is present everywhere. It is found in the seamstress's needle and in tools for all trades, in machinery, tractors, vehicles, ships and even in gigantic bridges over rivers and seas.

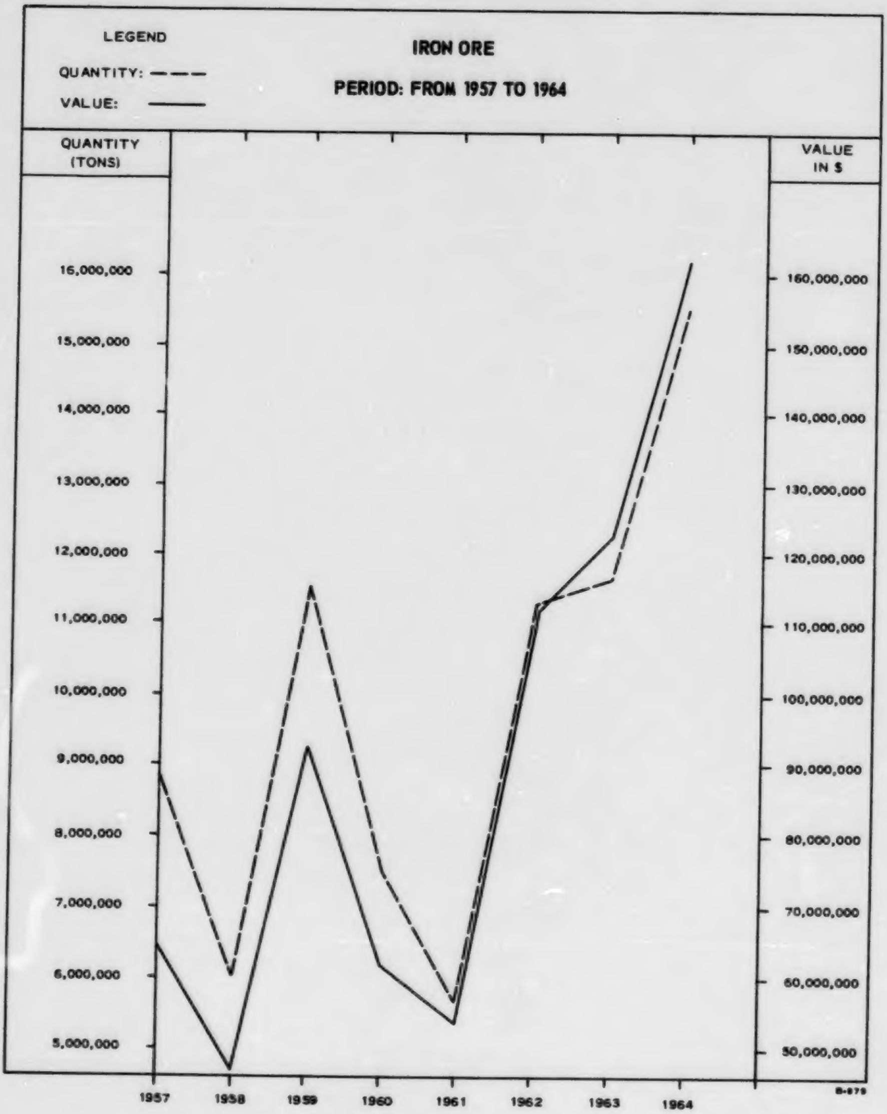
Production of iron ore in Quebec in 1964 attained 15,512,916 tons, as against 11,650,787 tons in 1963. The output of iron was 3.18% higher in 1963 than in 1962 and 33.15% more in 1964 than in the preceding year.

With such an important iron output, Quebec occupies first rank among the provinces for the total production of Canada. To this must be added iron extracted from titaniferous iron ore, the production of which in 1963 totalled 221,241 tons and 429,383 tons in 1964.

Table 17 - Production of Iron Ore in Quebec* from 1957 to 1964

Year	Quantity (Tons)	Value
1957	8,872,948	$ 65,805,057
1958	6,060,325	46,859,490
1959	11,515,169	92,497,012
1960	7,457,971	61,752,485
1961	5,639,931	53,627,608
1962	11,292,025	112,251,719
1963	11,650,787	122,800,862
1964 *	15,512,916	161,880,175

* In view of the uncertainty concerning the boundary between Quebec and Newfoundland, it is possible that these figures do not represent all the production of iron ore in Quebec.


LEGEND
QUANTITY: – – –
VALUE: ———
IRON ORE
PERIOD: FROM 1957 TO 1964
QUANTITY (TONS)
VALUE IN $
16,000,000
15,000,000
14,000,000
13,000,000
12,000,000
11,000,000
10,000,000
9,000,000
8,000,000
7,000,000
6,000,000
5,000,000
160,000,000
150,000,000
140,000,000
130,000,000
120,000,000
110,000,000
100,000,000
90,000,000
80,000,000
70,000,000
60,000,000
50,000,000
1957
1958
1959
1960
1961
1962
1963
1964
B-879

LEAD

In metals and their usage, lead has a choice place owing to its properties. The most highly regarded of these are resistance to corrosion, a low melting point, malleability and high density.

Apart from entering into industry in general, lead is used mainly for welding alloys, printing type, piping and ammunition. Of late, other more widespread and important fields have been discovered for this metal.

In cities where vibration is caused by trains, by heavy traffic, etc., lead contributes in a great measure to sound-proofing buildings against outside vibration and noise.

Lead-lined panels are already being used in a good number of constructions in Canada and in the United States to reduce the transmission of noise from one room to another. In the aviation industry, plastic material impregnated with lead is widely used as a sound-proofing material.

A comparatively new, and very important, use of lead enters into the making of radiation shields. It has been used for many years in increasing quantity in the manufacture of containers for the transportation of radioactive substances.

Lead production in Quebec for 1964 was 7,908,961 pounds, against 8,673,195 pounds in 1963. It suffered a slight decrease during both years compared with the 1962 production, which was,9,432,012 pounds. However, although slightly lower than that of 1962, the production for 1963 and 1964 showed notable progress over the period extending between 1957 and 1961. As a matter of fact, this progress equals increases ranging from 27% to 60% in 1963 and from 17% to 46% in 1964.

The average price of lead, which was 9.92 cents a pound in 1962, attained 11 cents in 1963 and, in 1964, it was 13.44 cents a pound, an increase of more than 35% over the 1962 price. This explains the lack of parallelism of the lines in the diagram, starting from that date.

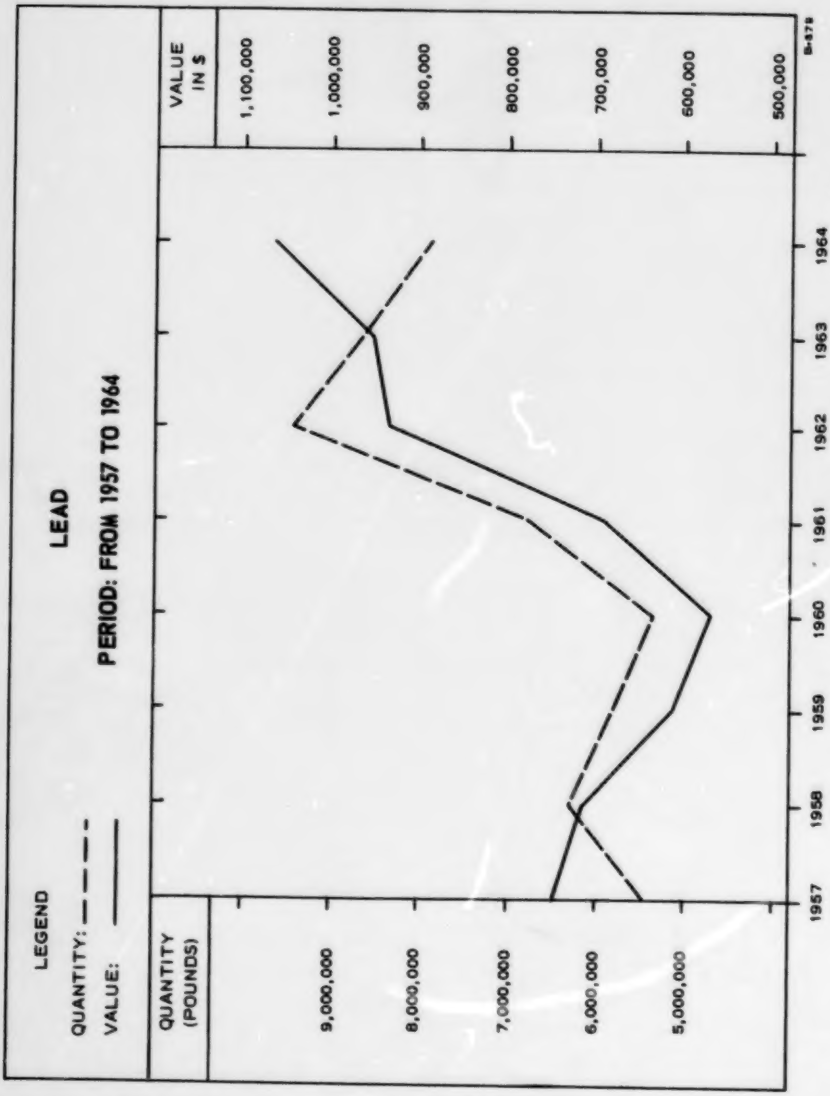

LEAD
PERIOD: FROM 1957 TO 1964
LEGEND
QUANTITY: — — — —
VALUE: ————
QUANTITY (POUNDS)
9,000,000
8,000,000
7,000,000
6,000,000
5,000,000
VALUE IN $
1,100,000
1,000,000
900,000
800,000
700,000
600,000
500,000
1957
1958
1959
1960
1961
1962
1963
1964
B-878

Table 18 - Production of Lead in Quebec
from 1957 to 1964

Year	Quantity (Pounds)	Value	Year	Quantity (Pounds)	Value
1957	5,417,795	$ 756,324	1961	6,784,464	$ 692,694
1958	6,299,475	715,620	1962	9,432,012	935,656
1959	5,819,148	617,412	1963	8,673,195	954,051
1960	5,388,901	570,195	1964	7,908,961	1,062,964

MOLYBDENUM

As shown in the diagram and in the table that follows, the production of molybdenum in Quebec marked a spectacular increase during 1964. From 1959 to 1963, production increased yearly only in proportions varying from 1% to 5%,whereas in 1964 it attained 1,185,074 pounds, which represented a rise of 42.08% over 1963.

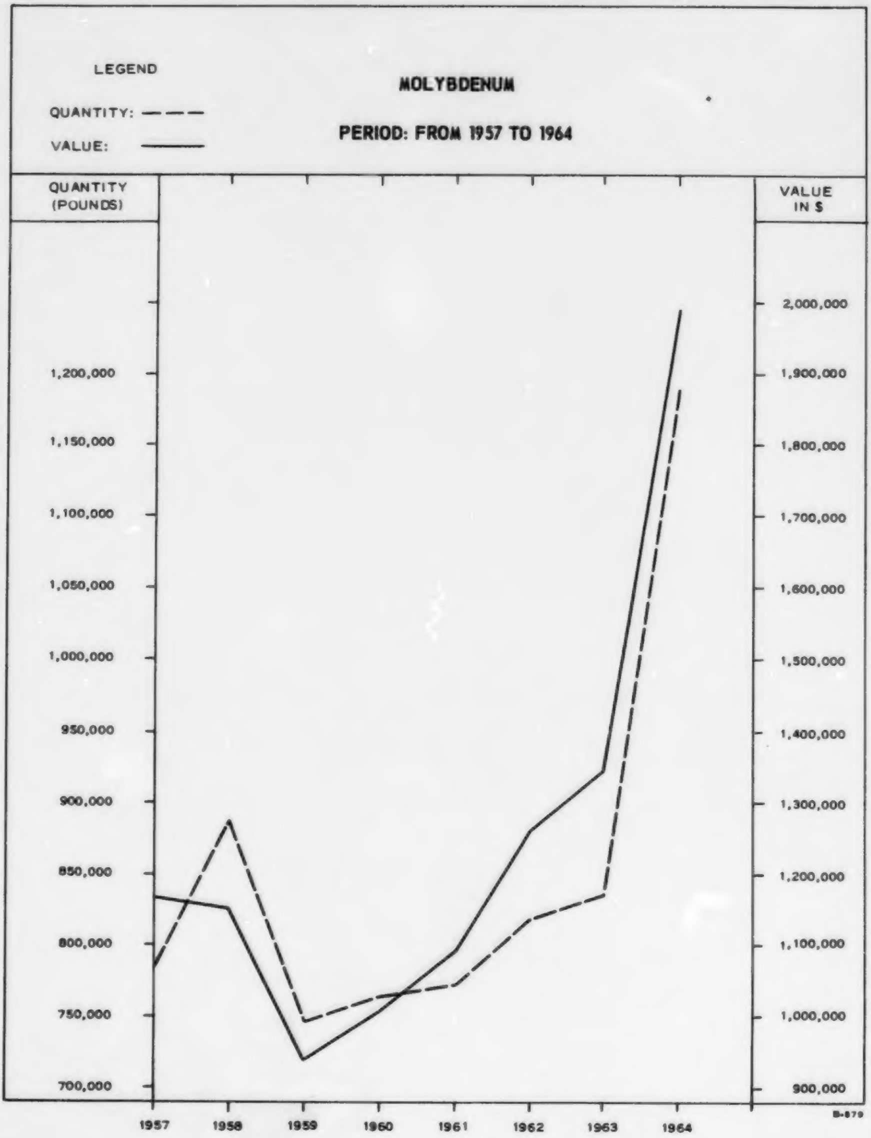
The foregoing is a very encouraging sign for the future of this substance in Quebec. Its importance is great in various industrial fields.

Molybdenum has many uses and its most striking is as an additive to steel. In effect, minute quantities of molybdenum added to steel give to this metal highly appreciable qualities of hardness and of uniformity in the manufacture of heavy metallic pieces. It is also used in the electronic industry and has a new role of the highest importance as a radioactive indicator in soil conditioning.

Quebec is the major producer in Canada and its share represents 96.73% of the total Canadian production.

Table 19 - Production of Molybdenum in Quebec
from 1957 to 1964

Year	Quantity (Pounds)	Value	Year	Quantity (Pounds)	Value
1957	783,739	$ 1,166,557	1961	771,358	$ 1,092,201
1958	888,264	1,152,838	1962	817,705	1,261,451
1959	748,566	940,596	1963	833,867	1,344,004
1960	762,207	1,005,880	1964	1,185,074	1,991,294



MOLYBDENUM

PERIOD: FROM 1957 TO 1964

NICKEL

Nickel was mentioned for the first time in 1962 on the list of mineral substances of Quebec with a production of 3,113,151 pounds; this figure was increased to 5,011,649 pounds in 1963 and attained 4,677,108 pounds in 1964.

These first production figures are very encouraging. Compared to the 1962 totals, they show a very marked increase of 61% in 1963 and 50.24% in 1964.

Nickel possesses many qualities. Its uses in ferrous or non-ferrous products are widespread and important. It is resistant and hard, tough and ductile. On the other hand it is anticorrosive at low, as well as at high, temperatures. The price of nickel in 1963 and 1964 ranged between 80 and 85 cents a pound.

Table 20 - Production of Nickel in Quebec from 1962 to 1964

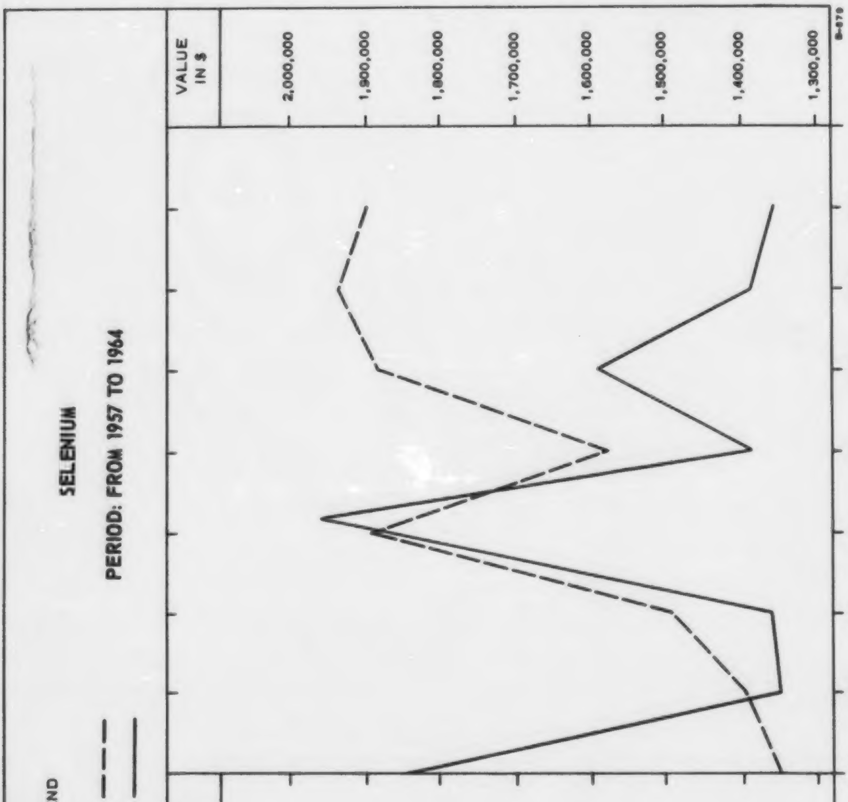
Year	Quantity (Pounds)	Value
1962	3,113,151	$ 2,599,481
1963	5,011,649	4,209,785
1964	4,677,108	3,928,771

SELENIUM AND TELLURIUM

Selenium and tellurium are metalloids recovered as by-products in the refining of copper during the treatment of slime deposited in the electrolytic refining plants.

Selenium is in demand in the electronic industry. It is used as a coloring substance in the manufacture of lenses used in traffic lights. In chemistry it is used as a catalyst in the preparation of cortisone and of nicotinic acid. In pharmacy it enters into the composition of pharmaceutical specialties for the treatment of skin diseases.

Tellurium is used in the manufacture of rubber to which it gives added resistance to wear and abrasion. It also enters into the manufacture of thermoelectric apparatus for the transformation of heat into electricity.


SELENIUM
PERIOD: FROM 1957 TO 1964
LEGEND
QUANTITY: — — —
VALUE: ———
QUANTITY (POUNDS)
300,000
280,000
260,000
240,000
220,000
200,000
180,000
160,000
VALUE IN $
2,000,000
1,900,000
1,800,000
1,700,000
1,600,000
1,500,000
1,400,000
1,300,000
1957
1958
1959
1960
1961
1962
1963
1964

Production of selenium and tellurium has increased steadily from year to year. In 1963 and 1964 production was slightly higher than during 1961 and 1962. On the other hand the value of selenium was lower despite the production increases noted above. This is explained by a lowering of the average price of this metal,which reached $7 per pound in 1960 and which decreased gradually to $4.85 in 1963 and 1964.

The opposite was true for tellurium, the price of which has increased appreciably since 1960. Tellurium was $3.50 a pound and reached $6.50 during 1963 and 1964.

Table 21 - Production of Selenium in Quebec from 1957 to 1964

Year	Quantity (Pounds)	Value	Year	Quantity (Pounds)	Value
1957	168,290	$ 1,851,190	1961	214,998	$ 1,397,487
1958	179,397	1,345,478	1962	276,409	1,589,352
1959	194,233	1,359,631	1963	286,042	1,387,304
1960	279,759	1,958,313	1964	279,834	1,357,195

SILVER

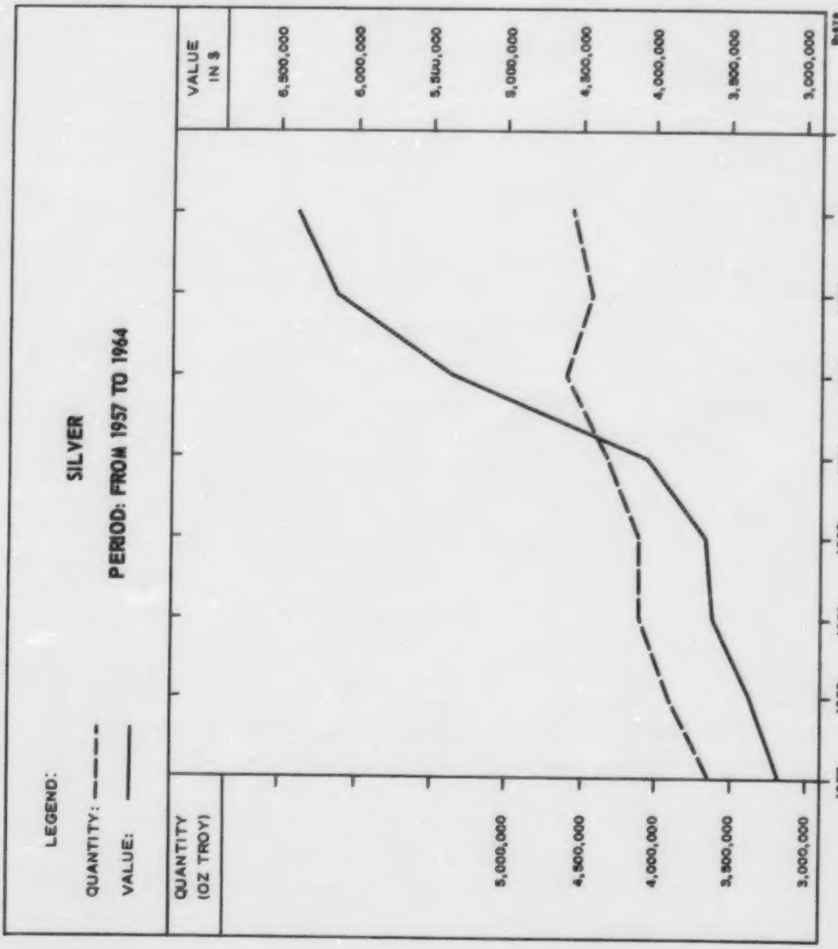
As can be seen, the diagram for the production of silver, a precious metal, shows a regular yearly increase since 1957. Concerning its value, the very marked increase shown in the diagram for the years 1962, 1963 and 1964 does not parallel production for the same years because of a raise in the average price of this metal during the same period. In fact,the average price in 1961 was $0.9426 per ounce troy. In 1962, it attained $1.165; in 1963, the price was $1.384 per ounce troy and,in 1964, it averaged $1.40.

In total production for Canada, Quebec ranks fourth in importance with 4,564,559 ounces in 1964. This represents 18.61$ of the total silver production for the whole country.

Up until recent years, silver was used for the minting of coins and in silverware. However, today's ever-increasing industrial usage of silver has induced most countries to substitute less precious metals, such as nickel and aluminum, for silver in their coinage.

Table 22 - Production of Silver in Quebec from 1957 to 1964

Year	Quantity (Troy ounces)	Value	Year	Quantity (Troy ounces)	Value
1957	3,646,168	$ 3,185,657	1961	4,315,844	$ 4,068,115
1958	3,906,815	3,391,506	1962	4,603,266	5,362,805
1959	4,109,772	3,607,558	1963	4,441,644	6,147,235
1960	4,114,993	3,658,640	1964	4,564,558	6,390,381


SILVER
PERIOD: FROM 1957 TO 1964
LEGEND:
QUANTITY: – – – –
VALUE: ——
QUANTITY (OZ TROY)
5,000,000
4,500,000
4,000,000
3,500,000
3,000,000
VALUE IN $
6,500,000
6,000,000
5,500,000
5,000,000
4,500,000
4,000,000
3,500,000
3,000,000
1957
1958
1959
1960
1961
1962
1963
1964

ZINC

Progress during 1964 in Quebec for the production of zinc relatively exceeded that made by all other substances in the same year. Output for the year more than trebled that of 1963. During 1963 it amounted to 150 million pounds and, in 1964, it exceeded 473 million pounds.

This increase is explained by the production in 1964 of more than 328 million pounds of zinc by two firms in full expansion in Quebec. They are Mattagami Lake Mines Ltd., which produced 256 million pounds, and Orchan Mines Ltd., which produced 72 million pounds.

During 1963 Quebec ranked second in Canada with a production of 150 million pounds. In 1964 it ranked first, well ahead of British Columbia, which up to that date led in the production of this metal in Canada.

Uses of zinc are widespread in numerous industries. It is used among others in the galvanizing process as a protective coating against rust for iron and steel products; in power transmission line pylons, for weatherproofing railway material, for protecting automobile frames against corrosion caused by salt solutions used on winter roads, etc.

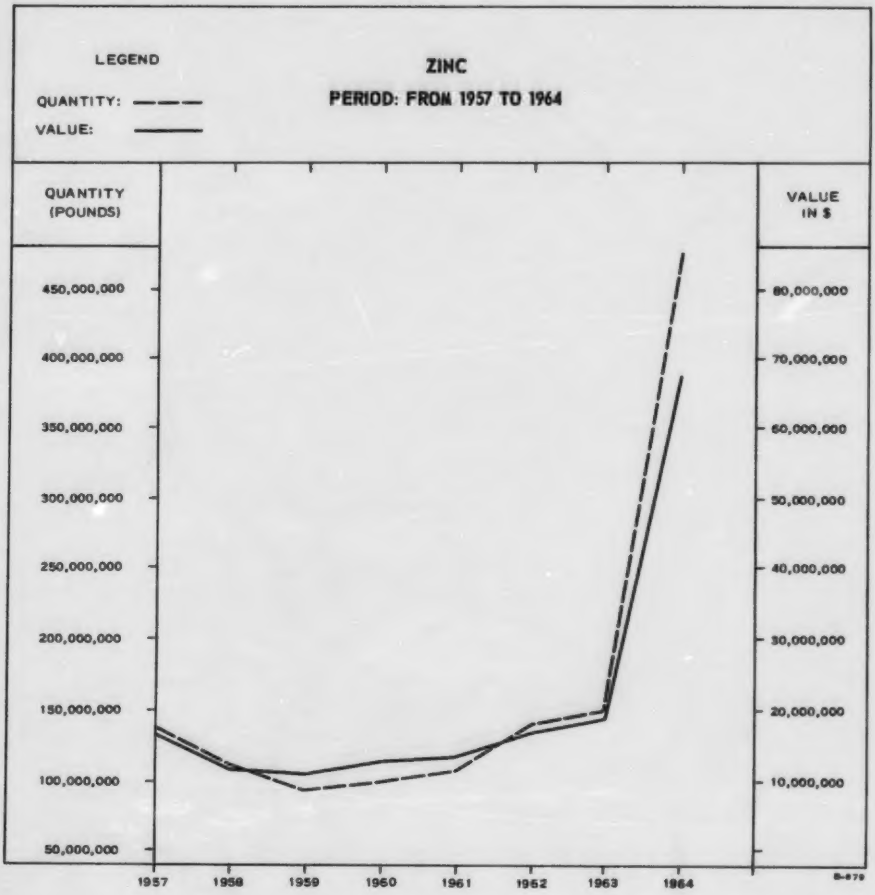
Zinc oxide also has multiple uses: in the manufacture of rubber, of paint, of rayon thread, of ceramics, of inks, of matches and of numerous other products of current use.

Zinc derivatives are used in numerous industries such as the purifying of fatty materials, the preparation of dyes, in the precipation of gold and silver from cyanide solutions, etc.

The average price of zinc has shown important variations. From 12.10 cents a pound in 1962 it went to 12.78 cents in 1963 and, during 1964, reached 14.17 cents per pound.

Table 23 - Production of Zinc in Quebec from 1957 to 1964

Year	Quantity (Pounds)	Value	Year	Quantity (Pounds)	Value
1957	148,589,484	$ 17,964,469	1961	108,010,062	$ 13,598,467
1958	113,845,036	12,386,340	1962	141,512,960	17,123,068
1959	94,115,963	11,519,794	1963	150,168,758	19,191,567
1960	99,614,995	13,298,602	1964	473,080,673	67,035,531


LEGEND
QUANTITY: — — —
VALUE: ———
ZINC
PERIOD: FROM 1957 TO 1964
QUANTITY (POUNDS)
450,000,000
400,000,000
350,000,000
300,000,000
250,000,000
200,000,000
150,000,000
100,000,000
50,000,000
VALUE IN $
80,000,000
70,000,000
60,000,000
50,000,000
40,000,000
30,000,000
20,000,000
10,000,000
1957
1958
1959
1960
1961
1962
1963
1964
B-879

NON-METALLIC SUBSTANCES

INDUSTRIAL MINERALS

The industrial minerals group, which includes more than 20 substances with asbestos as the leader, is described in detail, with quantities and values for 1963 and 1964, in the general table on page 4 of the present publication.

Mica, sulfur and peat are the only substances that show a slight decrease in production during 1964; all others in this group show important and variable increases compared with the 1963 figures.

In percentage, these rises are as follows:

Industrial limestone and marble	23.60%
Industrial lime	5 %
Feldspar	5 %
Lithium	64 %
Marl	97.80%
Ochre and iron oxide	5.60%
Industrial quartz and sand	14.40%
Soapstone and talc	10.80%
Titanium (oxide and other products)	49 %

The total value of the substances in this group reached $165 million in 1964 against $148 million in 1963. These figures represented, in 1964, 24% of the total value of the mineral substances of the province and, in 1963, 27%.

It should be noted that the value of asbestos by itself, in 1964, constituted 75% of the total value of this group and, in 1963, over 79%.

To conclude, this group of industrial minerals is forging ahead, on a parallel with Quebec's mineral production as a whole. Thus, everything points to continuation of its progress in future years within Quebec's mineral production framework.

ASBESTOS

In quantity and value, asbestos ranks first each year in this group. The increase in production of this industrial mineral in Quebec is progressive and regular. An adequate idea of its progress is given by the fact that its production in 1964 was 11% over that of 1963 and 47% over that of 1958.

Quantities produced in 1963 and 1964 were, respectively, 1,158,209 tons and 1,285,564 tons. For 1963 production represented 92.50% of the Canadian total and 36.80% of the world total. In 1964 these figures were 90.60% and 36.30% respectively.

Table 24 - Production of Asbestos in Quebec in 1963 and 1964

Grade	1963 Shipments			1964 Shipments		
	Tons (2000 lb.)	Value without Containers		Tons (2000 lb.)	Value without Containers	
		Total	Per Ton		Total	Per Ton
Crude Asbestos						
Groups Nos. 1 and 2 (Crudes No. 1. No. 2 and others)	217	$ 177,045	$ 815.88	207	$ 157,248	$759.65
Milled Asbestos						
Group No. 3 (Spinning)	23,063	8,527,899	369.77	31,833	9,853,724	309.54
Group No. 4 (Shingle)	292,161	52,874,499	180.98	319,749	54,797,175	171.38
Group No. 5 (Paper)	153,735	19,091,846	124.19	188,244	23,314,015	123.85
Group No. 6 (Waste, stucco or plaster)	227,643	17,621,682	77.41	232,781	17,134,863	73.61
Group No. 7 (Refuse or shorts)	453,354	18,071,510	39.86	507,144	19,555,627	38.56
Group No. 8 (Sand)	8,036	217,653	27.08	5,606	110,801	19.76
Total ...	1,158,209	$116,582,134	$100.66	1,285,564	$124,923,453	$ 97.17
Group No. 9 (By-products: gravel and stone)	49,530	$ 33,557	$ 0.68	34,264	$ 29,330	$ 0.86
Total ...	1,207,739	$116,615,691		1,319,828	$124,952,783	
Rock mined	43,207,616			44,280,726		
Rock milled	15,654,021			16,537,706		

Table 25 - Comparative Statement of Asbestos Production in Quebec, in Canada and in the World from 1957 to 1964

Year	Production (Tons)			Percentage of	
	Quebec	Canada	World	Canada	World
1957	993,424	1,046,086	2,080,000	94.9	48.0
1958	873,604	925,331	1,865,000	94.4	46.8
1959	992,196	1,050,429	2,060,000	94.4	48.1
1960	1,054,424	1,118,426	2,210,000	94.3	47.7
1961	1,103,545	1,175,615	2,770,000	93.8	43.8
1962	1,125,131	1,215,814	3,055,000	92.5	40.6
1963	1,158,209	1,275,530	3,200,000	92.5	36.8
1964	1,285,564	1,419,851	3,540,000	90.6	36.3

Table 26 - Annual Shipments of Asbestos According to Grades from 1955 to 1964

(Tons of 2,000 lbs.)

Year	Crudes	Fibre	Shorts	Total Asbestos Shipped	Sand, Gravel and Waste Rock
1955	572	353,510	667,983	1,022,065	28,582
1956	644	345,951	620,550	967,145	45,428
1957	604	351,373	641,447	993,424	13,652
1958	574	290,864	582,166	873,604	18,450
1959	355	345,863	645,978	992,196	29,532
1960	235	419,246	634,943	1,054,424	51,625
1961	163	478,701	624,681	1,103,545	41,696
1962	194	463,941	660,996	1,125,131	40,733
1963	217	468,959	689,033	1,158,209	49,530
1964	207	539,826	745,531	1,285,564	34,264

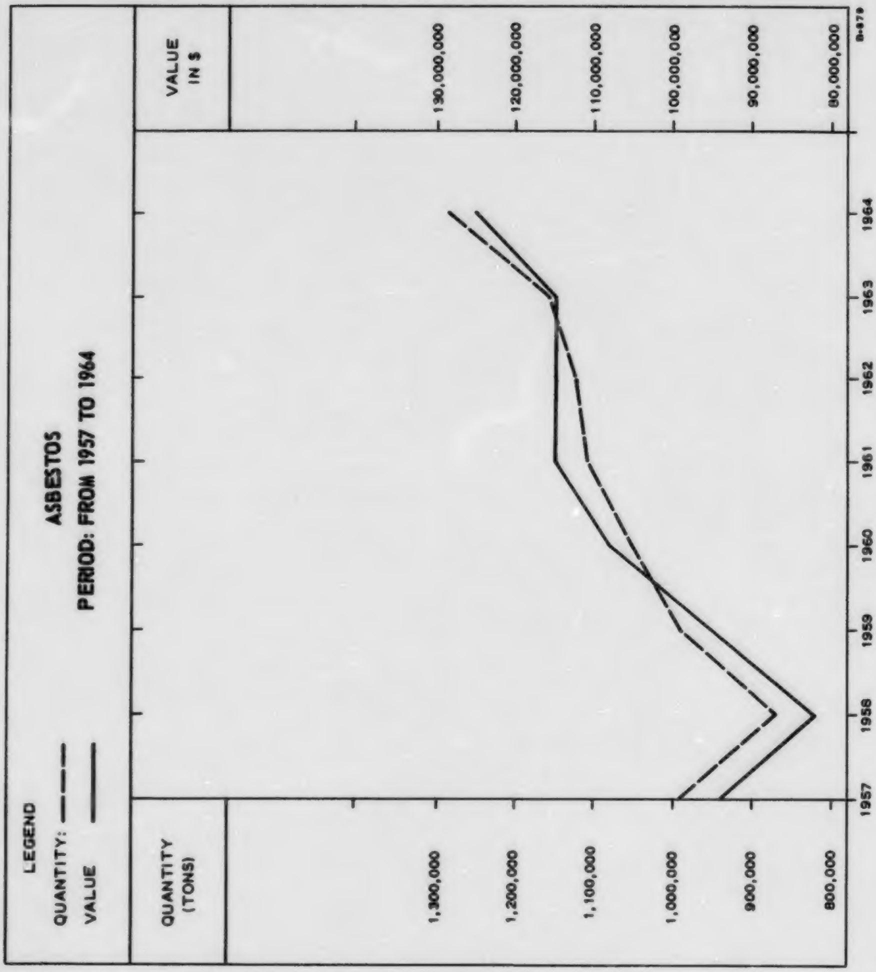

ASBESTOS
PERIOD: FROM 1957 TO 1964
LEGEND
QUANTITY: — — —
VALUE ———
QUANTITY (TONS)
1,300,000
1,200,000
1,100,000
1,000,000
900,000
800,000
VALUE IN $
130,000,000
120,000,000
110,000,000
100,000,000
90,000,000
80,000,000
1957
1958
1959
1960
1961
1962
1963
1964
B-479

Table 27 - Data on Quebec Asbestos Mining Industry for Years 1955 to 1964

Year	Fibre Shipped (Tons)	Total Value	Total Average Value (Per Ton)	Fibre Produced (Tons)	Asbestos Content Per Ton of Rock Mined (Pounds)	Average Value Per Ton of Rock	Rock Mined (Tons)
1955	1,022,065	$ 88,607,804	$ 89.88	1,022,343	121.59	$ 5.46	16,815,642
1956	967,145	90,531,456	96.92	995,535	95.22	4.48	20,905,988
1957	993,424	93,616,875	93.28	989,089	93.58	4.42	21,138,451
1958	873,604	82,028,700	93.89	920,708	85.35	3.80	21,574,610
1959	992,196	95,226,769	95.98	1,015,336	89.99	4.22	22,565,234
1960	1,054,424	107,788,171	102.22	1,050,341	65.16	3.34	32,239,218
1961	1,103,545	115,944,729	105.07	1,096,509	59.24	3.13	37,015,224
1962	1,125,131	114,297,884	101.59	1,134,698	55.68	2.80	40,761,220
1963	1,158,209	116,582,134	100.66	1,149,851	53.22	2.68	43,207,616
1964	1,285,564	124,923,453	97.17	1,223,433	55.25	2.82	44,280,726

Table 28 - Milling Capacity of Asbestos Mines, in Tons per 24 Hours

Mines	Townships	Capacity
Asbestos Corporation Limited		
King-Beaver Mine	Thetford	6,000
British Canadian Mine No. 1	Coleraine	5,500
British Canadian Mine No. 2	Coleraine	4,000
Normandie Mine	Ireland	4,500
Bell Asbestos Mines Limited	Thetford	2,500
Canadian Johns-Manville Co. Ltd.	Shipton	20,000
Carey Canadian Mines Limited	Broughton	3,000
Flintkote Mines Limited	Thetford	2,000
Lake Asbestos of Quebec Limited	Ireland	5,000
National Asbestos Mines Limited	Thetford	3,000
Nicolet Asbestos Mines Limited	Tingwick	3,000

LIME

Table 29 - Distribution of the Production of Lime in 1963 and 1964 (tons)

Classification	1964		1963	
	Quicklime	Hydrated Lime	Quicklime	Hydrated Lime
Industrial Lime				
Sugar refinery	984	7,579	- - -	6,189
Tanneries	93	942	94	835
Pulp and paper mills	132,645	13,416	126,120	6,684
Agriculture	60	9,201	74	5,417
Iron and steel furnaces ...	17,423	1,250	12,246	1,998
Non-ferrous smelters	4,639	68,085	7,715	38,419
Uranium plants	2,405	130	6,305	- - -
Kyanide and flotation mills	2,504	4,774	2,850	9,842
Glass works	3,388	- - -	2,513	- - -
Carbide and other industrial uses	52,081	13,140	76,049	16,538
Total	216,222	118,517	233,966	85,922
Building Lime				
Building trade	5,208	25,032	10,404	22,898
Dealers and unspecified uses	14	4,061	- - -	5,011
Total	5,222	29,093	10,404	27,909
GRAND TOTAL	221,444	147,610	244,370	113,831

LIMESTONE

Table 30 - Limestone in 1963 and 1964

Classification	1964		1963	
	Quantity (tons)	Value $	Quantity (tons)	Value $
Building Limestone				
Building stone, rough	4,779	38,973	6,592	67,863
Building stone, dressed ...	6,911	344,145	14,272	881,232
Asphalt filler	31,675	137,201	26,387	115,555
Flagstone	225	2,250	200	2,200
Rubble and rip-rap	138,852	120,767	186,502	190,267
Crushed stone	30,237,350	29,101,229	24,127,731	24,932,189
Others	18,035	83,217	- - -	- - -
Total	30,437,827	29,827,782	24,361,684	26,189,306
Industrial Limestone				
Flux	11,116	15,853	10,179	14,382
Pulp and paper mills	196,098	476,107	162,135	500,385
Agricultural pulverized limestone	940,775	2,259,913	753,872	1,840,002
Poultry grit	1,876	11,684	548	3,285
Other industrial uses	54,635	366,506	47,914	344,544
Total	1,204,500	3,130,063	974,648	2,702,598
GRAND TOTAL	31,642,327	32,957,845	25,336,332	28,891,904

MARL

Table 31 - Production of Marl in Quebec from 1956 to 1964

Year	Quantity (Tons)	Value	Year	Quantity (Tons)	Value
1956	70,581	$ 105,872	1961	68,812	$ 120,421
1957	127,143	190,714	1962	53,016	92,778
1958	144,434	216,651	1963	42,736	74,788
1959	130,375	195,563	1964	84,487	147,852
1960	127,000	190,500			

MICA

Table 32 - Distribution of the Production of Mica in 1964 and 1963

Classification	1964 Quantity (Pounds)	1963 Quantity (Pounds)
Rough, mine-run	- - -	12,021
Mica for mechanical splitting	68,100	- - -
Ground mica	615,968	813,935
Scrap	61,340	12,000
Trimmed mica	20,406	100
Total	765,814	838,056

PEAT

Table 33 - Production of Peat in Quebec from 1955 to 1964

Year	Quantity (Tons)	Value	Year	Quantity (Tons)	Value
1955	32,383	$ 638,696	1960	56,731	$ 1,342,338
1956	40,269	951,644	1961	75,741	1,788,349
1957	48,704	1,140,476	1962	77,889	1,968,912
1958	43,669	1,056,811	1963	87,762	2,245,614
1959	50,578	1,282,081	1964	84,127	2,205,054

BUILDING MATERIALS

The building materials group, which appears in the general table of Quebec production, also shows very marked progress in 1964 compared with that of preceding years.

The value of products in this domain attained over $115 million in 1964, which exceeds by $13 million that of 1962. The 1964 output represents an increase of 12.74% over 1963, and of 19.79% over 1962.

Every substance in this group shows progress in 1964 with cement ranking first. Cement production has risen spectacularly since 1960. That year, production amounted to 1,876,000 tons and, by successive stages, reached 2,628,000 tons in 1964, representing an increase of more than 40% over 1960.

Increases, by percentage, in the production of other substances in this group during 1964 over the preceding year were the following:

Slate and shale	2,671.00%
Granite	66.89%
Sandstone	18.80%
Building marble	148.50%
Building limestone	24.94%
Sand and gravel	9.74%

The diagram for cement and the tables for other building materials given below show complementary aspects of the encouraging increase in building materials production in Quebec.

Everything indicates that this upward curve will not slacken. Quebec's importance and its continued development require that this area of the mining industry go forward in order to meet the ever-increasing needs during the coming years.

Table 34 - Building Contracts Let in Quebec

from 1958 to 1964

Year	Value in Dollars					Per Cent of Nation
	Residential	Business	Industrial	Engineering	Total	
1958	$ 412,210,900	$ 364,550,400	$ 88,214,400	$ 177,879,200	$ 1,042,854,900	29.0
1959	273,870,500	305,281,900	113,324,300	219,081,700	913,558,400	28.3
1960	173,853,500	326,319,500	73,183,800	149,570,000	722,926,800	23.6
1961	284,376,600	285,687,000	89,763,800	228,845,200	888,672,500	27.6
1962	397,931,200	304,673,300	38,517,200	173,840,600	914,962,300	27.3
1963	347,341,600	365,074,800	50,204,400	245,106,300	1,007,727,100	27.3
1964	350,128,400	360,074,100	121,461,000	326,689,400	1,158,352,900	24.0

From statistics compiled by MacLean Building Guide.

Table 35 - Distribution of Value of Production of Building Materials, 1963-64

Materials	1964	1963
Clay products	$ 6,839,772	$ 6,859,444
Cement and lime	41,948,283	37,368,875
Building stone	44,325,717	36,865,138
Sand and gravel	22,207,399	21,213,905
Totals	$115,321,171	$102,307,362

Table 36 - Production of Cement in Quebec from 1957 to 1964

Year	Quantity (Tons)	Value	Average Unit Price
1957	2,051,201	$ 30,267,092	$ 14.75
1958	1,903,635	28,686,095	15.07
1959	1,975,452	29,520,710	14.94
1960	1,875,997	28,315,159	15.09
1961	2,029,159	31,412,617	15.48
1962	2,242,651	35,046,740	15.62
1963	2,330,641	36,938,775	15.85
1964	2,628,841	41,590,355	15.82

Table 37 - Quantity and Value of Clay and Shale Products from 1957 to 1964

Year	Bricks		Other Products Value	Total Value
	Quantity (M)	Value		
1957	163,378	$ 6,885,096	$ 2,012,508	$ 8,897,604
1958	197,835	8,634,102	2,039,813	10,673,915
1959	185,175	8,135,595	2,238,567	10,374,162
1960	142,113	6,136,723	1,956,315	8,093,038
1961	148,509	6,341,787	1,854,003	8,195,790
1962	139,438	5,992,752	1,440,879	7,433,631
1963	119,109	5,212,212	1,647,232	6,859,444
1964	121,841	5,174,970	1,664,802	6,839,772

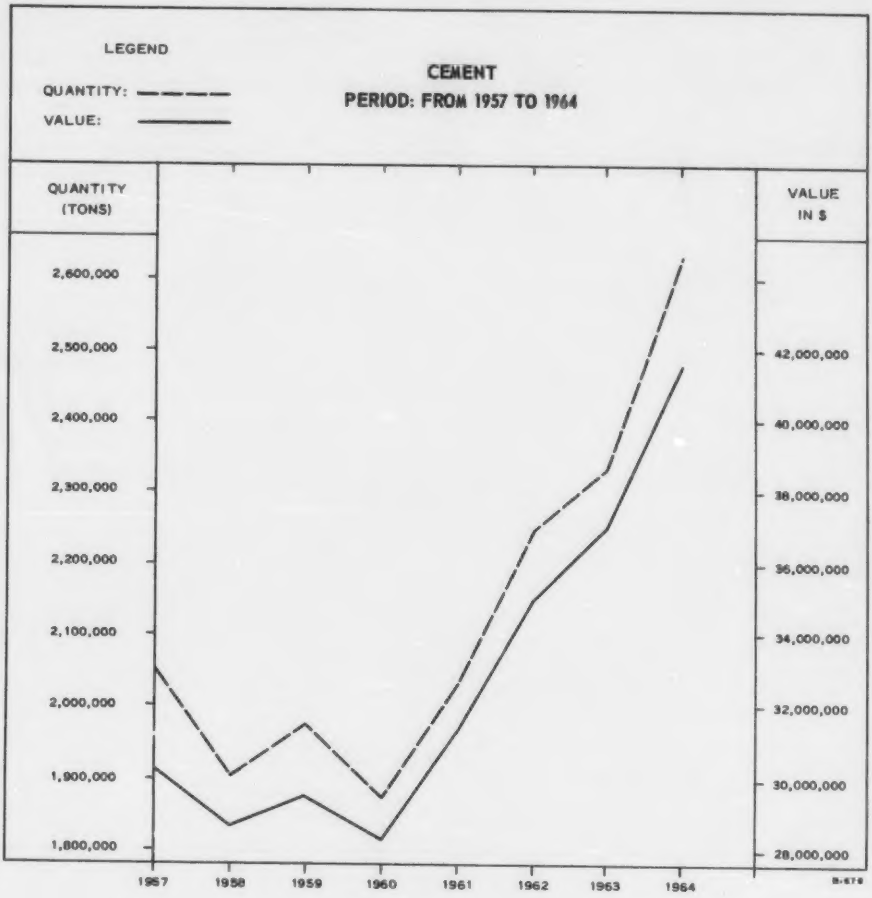

LEGEND
QUANTITY: – – – –
VALUE: ———
CEMENT
PERIOD: FROM 1957 TO 1964
QUANTITY (TONS)
2,600,000
2,500,000
2,400,000
2,300,000
2,200,000
2,100,000
2,000,000
1,900,000
1,800,000
VALUE IN $
42,000,000
40,000,000
38,000,000
36,000,000
34,000,000
32,000,000
30,000,000
28,000,000
1957
1958
1959
1960
1961
1962
1963
1964

Table 38 - Clay and Shale Products in 1963 and 1964

Classification	1964		1963	
	Quantity	Value	Quantity	Value
Brick:				
Common brick, soft mud process .... M	700	$ 14,000	1,000	$ 27,000
Face brick, stiff mud process .... M	53,144	2,475,531	55,668	2,732,288
Common brick, stiff mud process .... M	24,146	814,152	22,607	694,990
Face brick, dry press .... M	38,844	1,653,549	34,641	1,481,989
Common brick, dry press .... M	2,427	52,843	2,782	60,018
Ornament brick .... M	2,580	164,895	2,411	215,927
Total	121,841	$ 5,174,970	119,109	$ 5,212,212
Other Products:				
Structural tile and chimney blocks ...... Tons	43,771	$ 909,594	49,589	$ 1,027,368
Drain tile .... No.	5,842,900	483,286	4,707,247	371,791
Sewer pipe and flue lining	- - -	180,347	- - - -	177,925
Others	- - -	91,575	- - - -	70,148
Total		$ 1,664,802		$ 1,647,232
GRAND TOTAL		$ 6,839,772		$ 6,859,444

Table 39 - Production of Crushed Stone in Quebec in 1963 and 1964

Classification	1964			1963		
	Quantity (Tons)	Value	Average Per Ton	Quantity (Tons)	Value	Average Per Ton
LIMESTONE						
Commercial quarries:						
Montreal and Jésus islands	17,591,230	$16,694,730	$ 0.95	13,818,564	$14,425,073	$ 1.04
City of Quebec district	1,503,483	1,656,426	1.10	1,587,930	1,840,401	1.16
Other parts of the Province	11,142,122	10,747,997	0.96	8,696,373	8,585,696	0.99
Total	30,236,835	$29,099,153	$ 0.96	24,102,867	$24,851,170	$ 1.03
Non-commercial quarries	6,015	10,526	1.75	5,533	8,462	1.53
Total	30,242,850	$29,109,679	$ 0.96	24,108,400	$24,859,632	$ 1.03
GRANITE						
Commercial quarries	3,289,803	$ 3,679,615	$ 1.12	1,662,086	$ 1,891,850	$ 1.14
Non-commercial quarries	1,658,284	3,464,848	2.09	1,376,232	3,335,646	2.42
Total	4,948,087	$ 7,144,463	$ 1.44	3,038,318	$ 5,227,496	$ 1.72
SANDSTONE						
Commercial quarries	1,542,814	$ 1,820,875	$ 1.18	1,178,431	$ 1,399,970	$ 1.19
Non-commercial quarries	505,524	599,031	1.18	544,975	504,411	0.93
Total	2,048,338	$ 2,419,906	$ 1.18	1,723,406	$ 1,904,381	$ 1.11
TOTALS ...	37,239,275	$38,674,048	$ 1.04	28,870,124	$31,991,509	$ 1.11

Table 40 - Quantity and Value of Granite Sold in 1963 in 1964*

Classification	1964		1963	
	Quantity (Tons)	Value	Quantity (Tons)	Value
Building stone, rough	15,494	$ 288,334	17,566	$ 371,339
Building stone, dressed	14,897	1,614,569	17,194	1,701,076
Monumental and ornamental stone, rough	14,478	454,726	11,106	364,221
Monumental and ornamental stone, dressed	6,334	712,793	5,901	700,270
Curbstone	5,183	162,186	5,605	138,422
Paving blocks	70	2,400	- - - -	- - - -
Rubble and rip-rap	190,535	351,213	30,290	39,014
Crushed stone	4,948,087	7,144,463	3,038,473	5,233,596
Others	21,523	99,165	- - - -	- - - -
Total	5,216,601	$10,829,849	3,126,135	$ 8,547,938

* Number of companies: 44 in 1963 and 46 in 1964.

Table 41 - Distribution of Limestone in 1963 and 1964

Uses	1964	1963
	Quantity (Tons)	Quantity (Tons)
Construction	30,437,827	24,361,684
Manufacture of cement	3,663,838	3,410,082
Industrial limestone	1,204,500	974,648
Industrial lime (a)	548,462	535,497
Building lime (a)	49,178	56,811
Building marble	28,775	11,578
Total:	35,932,580	29,350,300

(a) To obtain the quantity of limestone required to manufacture lime, the quantities of quicklime must be divided by the factor 0.56 and those of hydrated lime, by 0.73.

Table 42 - Marble Sold in 1963 and 1964*

Classification	1964	1963
	Quantity (Tons)	Quantity (Tons)
Building and ornamental stone, dressed	668	543
Crushed marble for artificial stone, terrazzo, etc...........	22,202	11,035
Crushed stone	5,500	- - -
Others	405	- - -
Total:	28,775	11,578

* Number of companies: 6 in 1963 and 8 in 1964.

Table 43 - Quantity and Value of Sandstone Sold in 1963 and 1964*

Classification	1964		1963	
	Quantity (Tons)	Value $	Quantity (Tons)	Value $
Building stone, rough ...	7,538	68,270	4,260	36,339
Rubble and rip-rap	40,000	88,750	39,207	24,415
Crushed stone	2,048,338	2,419,906	1,726,616	1,921,233
Others	7,597	27,059	- - -	- - -
Total ...	2,103,473	2,603,985	1,770,083	1,981,987

* Number of companies: 13 in 1963 and 12 in 1964.

Table 44 - Quantity of Sand and Gravel Sold in 1963 and 1964

Classification	1964	1963
	Quantity (Tons)	Quantity (Tons)
Washed and screened sand and gravel ..	3,950,031	3,053,651
Ballast	388,798	721,883
Sand and gravel for building, concrete and roads	32,545,874	29,964,600
Sand and gravel for mine back-filling	52,506	49,430
Crushed gravel	10,891,272	9,779,653
Other sands	79,005	85,667
TOTAL:	47,907,486	43,654,884

EXPLORATION IN QUEBEC DURING 1963 AND 1964

NEW QUEBEC DISTRICT

During 1963 and 1964, mining exploration work done in New Quebec was concentrated in four regions, the principal one of which was the Labrador Trough.

Sakami Lake Area

There was no activity in this area during 1963. In 1964 Phelps Dodge Corp. of Canada Ltd. inaugurated a program of diamond drilling on its property on Sakami river, in No. 3220 township.

Richmond Gulf Area

- 1964 -

This sector had very little activity during 1964; two companies only, working together, did exploration work.

Mokta Explorations (Quebec) Inc. did prospecting work on the Southern Exploration and Development Corp. and Hudson Bay Syndicate Inc. properties in the Richmond group.

Prospecting Geophysics Ltd. completed an electromagnetic ground survey on a few of the magnetic anomalies revealed by aerial surveys done by Hunting Survey Corporation Ltd. in 1962.

Moreover, Mokta completed various geophysical works such as electrical soundings, the drawing of resistivity maps and a self-potential survey, in addition to geological mapping and diamond drilling.

Southern Exploration and Development Corporation holds a group of mining claims on the south shore of Richmond gulf in No. 4717 township. Sedimentary rocks of the Manitounuk and Richmond groups as well as diabase dikes and gabbro contain small quantities of lead, zinc and silver. During its exploration work this company made use of electromagnetic surveys done in 1962 by Hunting Survey Corporation Ltd., which covered a total area of 200 square miles, including Southern Exploration's property.

Cape Smith Basin Area

The Cape Smith Basin area witnessed only moderate activities during 1963 and 1964. However, this limited work contributed to an increased economic potential for this zone, which is rich in base metals.

- 1963 -

Bilson Quebec Mines Ltd. holds mineral exploration licenses Nos. 175 and 176 in this promising area. Detailed geological mapping of the area at the scale of 200 feet to the inch was carried out. Furthermore, the program of sampling, drilling, and magnetometer surveying on nickel-bearing mineralizations was continued.

Raglan Nickel Mines Ltd. holds mining exploration license No. 160, covering 12.34 square miles, and No. 174, covering 50.67 square miles, in addition to 215 mining claims, all about 50 miles south of Hudson strait. Numerous diamond drill holes were completed in C-1 and C-2 deposits at Cross lake. At Raglan lake, another showing was likewise drilled. In addition to the mapping of a 9.5-square-mile area — one half at the scale of 200 feet to the inch and the other half at 1,000 feet to the inch — electromagnetic and magnetic surveys were completed. The principal sulfides present are pyrrhotite, nickeliferous pyrrhotite, pentlandite, chalcopyrite, covellite, and pyrite. This apparently syngenetic mineralization is found in a folded, ultrabasic and serpentinized sill forming a synclinorium 30 miles long and between two and three miles wide.

At Dogue lake, about 2 miles south of Cross lake, the presence of asbestos indications was noted.

- 1964 -

Falconbridge Nickel Mines Ltd. did prospecting work for Bilson Quebec Mines Ltd. on territories covered by mineral exploration license Nos. 175 and 176. Diamond drill holes were completed and samples were taken over a 6,000-foot length. The most important mineralization is composed of pyrrhotite, pentlandite, and disseminated chalcopyrite in an ultra-basic sill. Three showings were studied in detail and nickel-bearing sulfide zones were revealed in each of them.

Raglan Nickel Mines Ltd. continued its work on an area under its two mineral exploration licenses: No. 174, covering 50.67 square miles, and No. 160, increased to 41.59 square miles through the addition of new territories.

Geophysical work such as magnetic and electromagnetic surveys was inaugurated, as well as diamond drilling.

Déception River Area

1963 - 1964

Asbestos Corporation Ltd. through its subsidiary, Hudson Strait Asbestos Ltd., revealed that during 1964 its asbestos deposit of Asbestos Hill contained high-tenor proved reserves amounting to 15 to 20 million tons. Moreover technical studies were continued concerning problems related to the mining of the deposit and the construction of a plant with a yearly capacity of 100,000 tons of asbestos fiber.

Exploration license No. 159, held by Murray Mining Corp. Ltd., was transferred in 1963 to Hudson Strait Asbestos Ltd., a wholly-owned subsidiary of Asbestos Corporation. This last-mentioned company completed the geological mapping on this property, which is in the immediate vicinity of Asbestos Hill. Three asbestos mineralizations were studied.

In No. 7918 township, in the vicinity of Konik-South river, about 90 miles west-southwest of Asbestos Hill, the company owns an important group of mining claims. The presence of 1/2-inch-long asbestos fiber has been revealed. Diamond drilling revealed that this asbestos is distributed very irregularly.

Labrador Trough

Intense mining activity prevailed in the Labrador Trough during 1963 and 1964. As in past years, numerous companies continued exploration or inaugurated new work in an area of high interest.

- 1963 -

By virtue of an agreement with St. Lawrence Columbium and Metals Ltd., Anaconda American Brass Ltd. holds Block B (west part) of mineral exploration license No. 189 in Keating Lake area. In addition to geological mapping, 14 drill holes, totalling 3,976 feet, were bored. Magnetic and electromagnetic surveys as well as sampling in interesting areas were done. Two trenches were dug and sulfides making up from 10% to 15% of the rock were discovered in a 2- to 7-foot-wide mineralized zone. The best assay gave 1.56% copper, but the average is below 0.8% copper. A systematic geochemical sampling completed the program of work in this area. No commercial value was reported other than the presence of small quantities of pyrrhotite, pyrite and chalcopyrite.

Andersen Lake Mines Ltd. owns a mining property in the Gérido Lake area, No. 6044 township, and had it mapped at the scale of 660 feet to the inch. Various other work, such as magnetic and electromagnetic surveys, was undertaken. Two major types of mineralization were observed: a) pyrite and pyrrhotite, of a syngenetic origin, in sediments; b) pyrrhotite and chalcopyrite in mottled gabbro. In addition, a detailed study was made of numerous gossan. In one particular mottled gabbro, sulfides formed up to 15% of the rock.

British Ungava Exploration Ltd. holds, in the vicinity of Andersen lake, 244 mining claims in Nos. 5944, 6044, and 6144 townships. Geophysical, magnetic and electromagnetic surveys were completed. The most favorable zone, with a length of 1,300 feet, a width of 400 feet and a depth estimated at 6 feet, lies on the east limb of a syncline. A few diamond drill holes and a 1,100-foot-long trench were dug in another showing.

Consolidated Canorama Explorations Ltd. did exploration work on its 15 claims in No. 4753 townships, 110 miles north of Schefferville. This area lies between Romanet and Dunphy lakes. No mineral deposit was discovered notwithstanding the fact that copper, lead, zinc, and iron had been discovered immediately north and south of the area.

Holannah Mines Ltd. dug numerous diamond drill holes on its Chrysler No. 2 deposit situated 2 miles southeast of Gérido lake in No. 5845 township. A geological map at the scale of 50 feet to the inch was completed.

Two main types of mineralization were found: a) massive pyrrhotite mineralization accompanied by an irregular quantity of chalcopyrite and nickel in the form of pentlandite and blende; b) disseminated pyrrhotite and chalcopyrite.

On the No. 8 Erickson property, also situated in the Gérido Lake area in No. 5845 township, Holannah owns a group of 12 mining claims.

Hollinger North Shore Exploration Co. Ltd. dug 15 trenches on its group of claims in the Romanet Lake area in No. 4852 township. Predominant sulfides are pyrite and chalcopyrite. In its Pénélope Lake property, Hollinger holds 132 claims in No. 5449 township. The company completed magnetic and electromagnetic surveys in addition to five diamond drill holes. However the percentage of copper is rather low. Mineralization is of the replacement type in shear zones.

Hollinger also holds an important group of mining claims in No. 5845 township in the Gérido Lake area. Considerable geophysical work was undertaken in numerous localities. This included magnetic, electromagnetic and gravity surveys, totalling about 56 miles of lines.

In No. 5845 township, west of Gérido and Prinzelles lakes, Hollinger did some diamond drilling. The presence of pyrrhotite, disseminated chalcopyrite, pyrite and graphitic clay was revealed.

Manicouagan Exploration Company holds mining claims covering an area of about 8 square miles in Nos. 5248 and 5249 townships, south of Fort MacKenzie. The presence of pyrite, disseminated pyrrhotite, as well as minor limonite,was revealed.

This property is south of the MacKenzie Mines Ltd. properties.

McIntyre Porcupine Mines Ltd. inaugurated geophysical work in the Wapanikskan Lake area, in No. 5348 township. Applied potential is higher than background for this area and the presence of pyrite or graphite has been deduced through the study of aeromagnetic maps. Supplementary work will be necessary for a better valuation of this sector.

By virtue of mineral exploration license No. 189, Block A, St. Lawrence Columbium and Metals Corp. did geological work in Retty Lake area, in No. 4259 township, about 40 miles north of Schefferville. Hollinger North Shore Exploration Co. Ltd. held a property by virtue of a mineral exploration license covering 3,900 square miles in this area during 1955-1959. Following an agreement with Anaconda American Brass Ltd., St. Lawrence Columbium and Hollinger, part of the territory under special license, namely Blocks A and B, covering 500 square miles, was divided into equal portions between St. Lawrence Columbium and Anaconda American Brass.

Apart from the presence of a small quantity of pyrrhotite and pyrite and a few specks of chalcopyrite and iron sulfide, no important deposit was discovered. The geological mapping was accompanied by geochemical prospecting as well as by magnetic and electromagnetic surveys.

Quebec Cartier Mining Co. continued its exploration work in the Mount Wright area in Normanskill township. In addition to geological mapping, dip needle and magnetometer surveys were completed, accompanied by diamond drilling.

Sogemines Development Co. Ltd. owns a group of 35 mining claims near Ungava bay, about 5 miles southwest of Hopes Advance Bay, in No. 6644 township. Magnetic and electromagnetic surveys, as well as diamond drilling in a mottled gabbro associated with peridotite, schist and volcanics, allowed the determination of four types of different mineralizations, namely:

1. massive pyrite and pyrrhotite in slates;
2. massive pyrrhotite containing chalcopyrite;
3. pyrrhotite forming from 15% to 45% of the rock and containing chalcopyrite. It is the main type of mineralization in this area.
4. disseminated pyrrhotite and chalcopyrite in mottled gabbro. Six trenches were dug in the most promising zones.

In a group of 45 claims situated 3 miles southwest of Hopes Advance Bay, copper mineralization was discovered in mottled gabbro. Magnetometer surveys were completed and five trenches were dug.

In a third group composed of 50 claims 2 miles south of Hopes Advance Bay, the presence of sulfides was discovered in mottled gabbro, in peridotite and in schists. A 6,400-foot-long by 20- to 25-foot-wide zone with a maximum depth of 700 feet contains pyrrhotite and chalcopyrite. Magnetic and electromagnetic surveys were completed and six trenches were dug in addition to a few diamond drill holes.

- 1964 -

Anaconda American Brass Ltd., through its Eastern Exploration Division, undertook work in the north part of Block B, under mineral exploration license No. 189, in Nos. 4258, 4357 and 4358 townships, in the vicinity of Keating lake. These are part of project T-2 of Anaconda American Brass Ltd.

Diamond drill holes totalling 1,618 feet and electromagnetic and magnetic surveys, as well as the taking of 2,000 geochemical samples, gave no precise result apart from the presence of small quantities of pyrite, pyrrhotite and chalcopyrite. The company, following these results, suggested that the agreement with St. Lawrence Columbium and Metals Corporation come to an end at the expiration of the license on March 9, 1965, and that all work be stopped in this area.

Moreover, this company drilled 15 holes in the Copper Lake area. In addition, geophysical surveys were completed.

Consolidated Canorama Explorations Ltd., following geological work undertaken during 1963 in Romanet Lake area, completed magnetic and electromagnetic surveys on the 600 acres which it owns in No. 4753 township. Overburden is very thick and outcrops are scarce. Nothing of interest was found.

Hollinger North Shore Exploration Company Ltd. gathered numerous samplings from its group of mining claims in Nos. 5852 and 5853 townships in Romanet Lake area.

When this sampling work will have been completed, diamond drilling, in addition to trenching, is planned.

McIntyre Porcupine Mines Ltd. drilled during February and March, 1964, in No. 5348 township, in the vicinity of Wanikskan lake, 1,570 feet of diamond drill holes in a zone containing base-metal mineralization.

Mid Chibougamau Mines Ltd. dug 30 diamond drill holes with the help of a portable rig on the 1,880 acres which it owns in Dunphy Lake area, in No. 4753 township.

Calcite veins, ranging in width from 6 inches to 3 feet and extending over a 150-foot-wide and 250-foot-long area, contain bornite, chalcopyrite and malachite.

Quebec Cartier Mining continued its work in the Mount Wright area, Normanskill and No. 2756 townships, on mining concessions Nos. 457, 484, 498, and 514, as well as on mining claims which the company owns in this area. Work was mostly concentrated in the vicinity of Moire lake, 75 miles northeast of Gagnon.

St. Lawrence Columbium and Metals Corporation subdivided its research program on Block A of mineral exploration license No. 189 in No. 4252 township, in Retty Lake area, completing a detailed geochemical study of localities likely to contain deposits of economic importance. Unfortunately, nothing of interest was discovered.

CHIBOUGAMAU DISTRICT*

In 1963 the number of claims registered was approximately 2,300 compared with 3,500 during the preceding year; ground surveys were made on only 35 mining properties, compared with 50 in 1962. On the other hand, the amount of drilling, distributed among 33 field parties, was 90,000 feet, whereas the corresponding figure for 1962 was 70,000 feet.

During 1964, exploration work was maintained at the 1963 level. The number of claims registered was 2,100 and diamond drilling, distributed among 31 field parties, totalled 85,000 feet. There was a marked gain in the number of ground surveys: a total of 55 compared with 35 during the preceding year.

Exploration work done during 1963 and 1964 was as follows:

1. North sector: Eastmain river - Otish mountains - Montagne lake - Mistassini lake - Frotet lake - Holton lake.

- 1963 -

This sector was of great interest to numerous mining companies during 1963.

Along Eastmain river, Taché Lake Mines Ltd. made a ground geophysical survey in the vicinity of the locality known as Grand Détour. Icon Syndicate also did exploration work in this same area.

At the same latitude, but much farther to the east, Icon Syndicate retained the services of Canadian Aero Surveys to make an airborne survey (magnetic as well as electromagnetic) on parts of Otish mountains during the month of March. During the summer, ground parties studied many of the anomalies discovered.

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* Chapters on work done in Chibougamau. Noranda, Val-d'Or, Matagami, Quebec and Montreal districts are based on annual reports prepared by resident geologists in these districts. They are: G. Duquette, J. Dugas, M. Latulippe, R.-A. Mathieu and A.-N. Deland.

About 20 miles south of Eastmain river, in No. 1917 township, Noranda Mines Limited used a portable drilling apparatus to study a lithium-bearing pegmatitic dike on the east side of Montagne lake. Farther eastward, in No. 2019 township, the same company visited many sulfide mineralizations and drilled nine holes totalling 452 feet.

The Canadian Nickel Company Ltd. studied a band of rocks that might possibly represent the southwest extension of the ones outcropping on the south shore of Montagne lake. Research work, which apparently occupied more than 50 men,covered a distance of over 80 miles.

Towards the end of summer, Merrill Island Mining Corporation Ltd. discovered numerous copper showings in the Horton Lake area about 25 miles north of Mistassini lake.

Announcement of this discovery caused a rush and at least 15 mining companies registered a minimum of 700 claims in townships Nos. 1930, 1931, 2030, and 2031. The mineralization is composed of chalcopyrite-bearing quartz lenses. From 2 to 15 feet wide, these lenses are within areas of broken, amphibolitized and garnetiferous green rocks with a fine to coarse grain. Molybdenite was seen in laminated green rock. A group of 20 claims in No. 1931 township, covering the main showings of Merrill Island Mining Corp. Ltd., was studied by magnetic and electromagnetic surveys and by diamond drilling. Drilling was also done on the Taché Lake Mines Ltd.property southwest of the Merrill Island property.

Much farther south, in No. 1530 township, on the east shore of Albanel lake, Muscocho Explorations Ltd. made a magnetic survey on its iron-bearing deposit.

As concerns the Lake Frotet Area, exploration work was considerably reduced owing to the disappointing results obtained in 1962. The Mining Corporation Ltd. completed its diamond drilling program by drilling five holes totalling 1,100 feet in No. 1322 township. Work was done from the frozen surface of the small lake near which the company made an interesting discovery of copper mineralization in 1962. In No. 1222 township, Lenmac Mines Ltd. drilled seven holes totalling 186 feet on anomalies discovered during 1962 following geochemical and geophysical surveys. In the same township, McAdam Mining Corp. Ltd. completed an electromagnetic survey on a property bordering the east side of its own properties. L. and S. Grubstake Syndicate did a great amount of trenching and dynamiting on a copper showing discovered during the fall of 1962 in No. 1222 township. Taché Lake Mines Ltd. completed its drilling program aimed at studying a copper showing in No. 1224 township; five shallow holes were drilled. Canadian Nickel Co. Ltd. was once more interested, during 1963, in numerous highly magnetic zones in the Frotet Lake area, particularly in townships Nos. 1223, 1322, and 1323. Kerr Addison Mines Ltd. also did exploration work in this area. In the vicinity of Anne lake, in No. 1222 township, Muscocho Explorations Ltd. owns an interesting lithiferous property. The staff of the Cominco Company made a study of it during the summer and took channel samples on many spodumene-bearing pegmatites.

Patino Mining Corp. sent two field parties to prospect the Grand Détour sector along Eastmain river.

At the same latitude, but farther east, Noranda Mines Ltd. did reconnaissance geological surveys.

James Bay Mining Corporation holds a group of 25 claims covering about 1,000 acres situated about 184 miles north of Matagami in No. 2314 township, Mistassini Territory. Geological work on both shores of Eastmain river did not reveal the presence of mineralization of economic value, except for minor pyrite and pyrrhotite.

In No. 2414 township the company made geological surveys on its claims.

South of Eastmain river, along the band of rocks bordering Colomb, Némiscau, and Montagne lakes, the staffs of Noranda Mines Ltd. and of Canadian Nickel Co. Ltd. were very active. More than 60 persons were said to be in the field during the summer. Interest was concentrated particularly on the Colomb Lake area where numerous geophysical anomalies were discovered in 1963 during airborne surveys.

There was not much activity in the Holton Lake area during 1964 following the rather disappointing results obtained from the diamond drilling program completed during December, 1963. It is to be recalled that Merrill Island Mining Corp. Ltd. had on that occasion drilled 24 holes on copper-molybdenum showings in No. 1931 township. Exploration work during the summer was done by Merrill Island Mining Corp. Ltd., which completed a detailed study of the geology of the mineralized sector, and by Chib-Kayrand Copper Mines Ltd., Taché Lake Mines Ltd., Yellowknife Bear Mines Ltd. and Icon Syndicate, which completed magnetic and electromagnetic surveys on their properties in No. 1931 township.

About 40 miles southwest, in No. 1628 township, Campbell Chibougamau Mines Ltd. studied a mineralization of base metals which had previously been drilled by Bracemac Mines Ltd.

Along the east shore of Albanel lake, more precisely in Nos. 1530 and 1531 townships, Standard Iron Mining Company, during the spring season, drilled six holes totalling 2,356 feet in an iron-bearing deposit.

As during 1963, there was only limited activity in 1964. The only major exception was Canadian Nickel Co. Ltd., which, during the spring season, completed an exploration program inaugurated four years previously. This company, between July, 1962,and March, 1964, had a study made of numerous highly magnetic zones in No. 1223 township. Eighteen holes were drilled totalling 6,326 feet. During the winter and in the same township, Patino Mining Corp. drilled three holes in two graphitic zones in the vicinity of Sauvage lake. About the same time, in No. 1323 township, L. and S. Grubstake Syndicate explored an anomaly by diamond drilling. Lastly, in No. 1424 township, about 1,000 feet of diamond drilling distributed in five holes was completed during the winter by the Icon Syndicate on a gold-bearing pyritic zone. Results were disappointing.

2 - Central Sector

a) Chibougamau - Opemisca Lake Area

- 1963 -

Two thirds of all exploration work done during 1963 in the whole Chibougamau district was carried out within the above-mentioned region. Among programs inaugurated during the year, that completed by Opemiska Copper Mines (Que.) Ltd., in Lévy township, was the most important and, possibly, the most successful. During its exploration of conductive zones indicated by geophysic, resistivity and polarization surveys, this company discovered a copper deposit about 450 feet long and 15 to 20 feet wide; it is cut by a fault at a depth of up to 450 feet. This deposit is located just south of Beaver pond about 4,000 feet northeast of Perry shaft. The copper tenor is reported to be about 3%. The mineralized zone, outlined by 18,000 feet of diamond drilling distributed in 26 holes, strikes southeast and dips sharply to the south. The host rock is a gabbro of the Ventures type similar to the one found in the Springer zone. In the same township, following an agreement with Chiboug-Copper Corp. Ltd., Opemiska Copper Mines (Que). Limited inaugurated during the summer a surface exploration program on the property of the first-mentioned party. All cores obtained from drilling done previously were submitted to a new examination.

McAdam Mining Corp. Ltd. obtained very encouraging tenors resulting from the drilling of two new asbestos deposits, "B" and "C", both situated in McCorkill township. A minimum of 5,500 feet of drilling was completed before the period of frost. It is to be recalled here that this company had already outlined in 1961 a deposit of about 14,400,000 tons of asbestos-bearing material valued at about $5 a ton. This deposit, designated as the "A" deposit, is situated halfway between B and C deposits.

In September, Bruneau Mines Ltd. decided to explore its copper-bearing deposit in McKenzie township with the aid of an adit. The two main zones to be explored are zones A and B.

In Obalski township, Chibougamau Pioneer Mining Corp. drilled more than 50 holes totalling close to 15,000 feet with the aim of determining the possibility of mining the four copper and gold-bearing zones that constituted the old Obalski mine. According to the company's engineers, 300,000 tons of ore was indicated by recent exploration work.

Cuvier Mines Ltd. and Prospectors Airways Company Ltd. explored, north of Opemisca lake, the sector composed mainly of basic and ultrabasic rocks in Cuvier township. Prospectors Airways made use of a portable rig to drill a few holes and to evaluate the favorable zones indicated by geophysical methods. In Gamache township, United Obalski Mining Company Ltd. explored a gold-bearing property formerly owned by Adnor Mines Ltd. United Obalski is also interested in another gold-bearing property straddling Francis river in McCorkill township; four holes were drilled in early spring. During March, Muscocho Explorations Ltd. made a preliminary examination of a copper-nickel-bearing property formerly owned by Noranda Mines Ltd. Magnetic and electromagnetic surveys were completed as well as 1,200 feet of diamond drilling.

Phelps Dodge Corp. of Canada Ltd. made geophysical surveys on part of the old Pennbec M'G Corp. property in Lamark township. The Icon Syndicate also did prospection work in the same area.

In McKenzie township, a 2,250-foot hole was drilled by Merrill Island Mining Corp. in a shear zone lying 2,000 feet west of the Kokko Creek mine shaft. In the vicinity of its four producing mines in McKenzie and Roy townships, Patino Mining Corp. (formerly Copper Rand Chibougamau Mines) drilled a minimum of 5,000 feet. Chib-Kayrand Copper Mines Ltd. drilled into highly magnetic areas along its common boundary with Bruneau Mines Ltd. in McKenzie township; seven holes totalling 4,407 feet were drilled. This same company drilled 12 shallow holes on an old gold-bearing property close to Fleury lake in the same township. West of

Half-Moon lake, in Obalski township, copper- and molybdenite-bearing veins were the object of geophysical surveys; Antoine Lessard, Léon Bouchard and Jack McAdam held the claims. In the same township two rather shallow holes were drilled on the property held by Madeleine Payette.

In O'Sullivan township the Chibougamau Mining and Smelting Company Inc. made a detailed study of the stratigraphy of rocks assigned to the Chibougamau Series (Proterozoic) in an effort to find beds favorable to an economic concentration of copper. It is a well-established fact that interesting copper mineralizations are found in these rocks.

The Société d'Exploration Minière Bélanger-Owens effected a magnetometric study of gold-bearing quartz veins outcropping along Obatagamau creek in Queylus township. This study was followed by eight shallow diamond drill holes.

During the spring, Chibougamau Asbestos Ltd. drilled seven holes totalling 1,548 feet from the frozen surface to study ultrabasic rocks west of Asbestos island in Roy township. In the same township, Rosario Explorations Ltd. drilled holes in three conductive zones on ground optioned from Quebec Smelting and Refining Ltd.

In Saussure township, Lucien Demers drilled three holes totalling 1,100 feet in the vicinity of a sulfide-bearing quartz vein outcropping along the east bank of the river immediately south of the bridge.

In Scott township, Amalgamated Mining Development Corp. Ltd. drilled four holes totalling 2,400 feet to study geophysical anomalies south of Scott lake. Gibson Mines Limited drilled two holes totalling 136 feet on a gold vein outcropping west of David lake. Rivermede Exploration Company made a magnetometric survey on Deschênes island where, many years previously, a gold discovery had been made.

- 1964 -

More than 75% of work done in the Chibougamau district during 1964 was concentrated in the Chibougamau-Opemisca lake area.

Half of it was done by McAdam Mining Corp. Ltd., which continued successfully the exploration of three asbestos-bearing zones (B, C, and D) in McCorkill township. According to G.H. Gibbs, consultant engineer of the company, soundings, up to May, 1964, indicated 40,000,000 tons of chrysotile-type asbestos ore that could be mined profitably by open-pit methods. These soundings also pointed to the probable existence of 60,000,000 tons of a similar tenor (close to $5 per ton), also workable by open-pit methods.

The company is considering the possibility of entering into production; the plant would have a daily capacity of 5,000 tons of ore and the yearly production would attain 75,000 tons of asbestos fiber.

During its exploration work for the discovery of additional sources of asbestos, McAdam Mining Corp. Ltd. optioned, during the summer, a property bordering its own on the west side, the Taché Lake Mines Ltd. property. A magnetometric survey and three drill holes were completed in the vicinity of Kyle and Lymburner lakes in Roy township. Additional diamond drilling was foreseen for the forthcoming winter. McAdam Mining Corp. Ltd. also optioned the property of Mid Chibougamau Mines Ltd., situated north of Antoinette lake in McKenzie township, where serpentinized ultramafic rocks were diamond drilled for the possible discovery of asbestos. Work was stopped after the second hole because of the poor results obtained.

In the north half of Roy and McCorkill townships, the Icon Syndicate had a three-man field party study old sulfide showings and known electrical conductives.

Patino Mining Corp. drilled, during the winter, three holes on Portage island, two of which are close to Machin bay and the third north of Wabasso lake. The sounding revealed variolitic pillowed lavas at the first locality and magnetic pyroxenite and gabbro at the second. In the vicinity of Geoff lake, in Roy township, the same company made geochemical and electromagnetic surveys on a band of chalcopyrite-bearing pyroclastic rocks. Results were disappointing.

North of Machin bay, in Roy township, Ran-Lux Mines Ltd. drilled, during the fall season, a few holes that cut variolitic pillowed lavas.

In McKenzie township, Beau Belle Chibougamau Mines Company dug 1,500 feet of trenches on its claims situated on the south limit of the Norbeau Mines (Quebec) Ltd. property.

In McKenzie township, 1/3 of a mile west of its own shaft and along its common boundary with Patino Mining Corp., Bateman Bay Mining Co. jointly completed with the latter two diamond drill holes.

Two mineralized sections were found in sheared anorthosite: one contained 1.63% copper over 7 feet and the other, 2.35% copper over 4 feet.

Just previous to the thawing season, a 18.5-foot massive siderite zone was cut at the opening of a hole drilled by Patino Mining Corp.

about half a mile south of the Cedar Bay Mines shaft. The first five feet assayed 3% copper and 0.14 ounce of gold a ton. Officers of the company are of the opinion that this zone merits a close study and have decided to carry out additional drilling.

Dauphin Iron Mines Ltd. bought, during the summer, the property of Gwillim Lake Gold Mines Ltd. in McKenzie township. This company intends first to make deep diamond drilling in the main (No. 1) vein and thereafter to have the surface showings discovered during the year studied by its geophysical party. A contract for 10,000 feet of diamond drilling was signed and work was inaugurated during December. It is interesting to note that during the 1936-1963 period, over 70 holes totalling 35,000 feet were completed on this property. It is reported that this drilling indicated the presence in the main vein of over 100,000 tons of gold-bearing ore valued at $9.27 a ton.

In Obalski township, Muscocho Explorations Ltd. drilled two holes in an anomaly west of Caché lake. Icon Syndicate executed the same kind of work in the southeast corner of Chibougamau lake; the few successes obtained encouraged this company to do additional exploration work during the 1965 winter.

In Queylus township three field parties were at work. Prudent Mining Corporation effected magnetic and electromagnetic surveys on a granitic area east of the southwest arm of Chibougamau lake. Merrill Island Mining Corporation Ltd. after optioning the Société d'Exploration Minière Bélanger-Owens property north of Palmor lake, drilled four shallow holes during the summer but discovered graphitic zones only. A little farther north, Mr. Francoeur did stripping and trenching on gold-bearing quartz veins.

In Scott township, Muscocho Explorations Ltd. drilled one shallow hole in a gold-bearing quartz vein outcropping on the shores of David lake.

In Brongniart township, Beaumont Mining Company did considerable stripping on a zone of massive pyrrhotite outcropping on a hill west of the southwest arm of Eau-Jaune lake; holes were also drilled with a portable rig.

In Barlow and Cuvier townships, Patino Mining Corp. did general prospecting work.

In Lévy township, Opemiska Copper Mines (Quebec) Ltd. following an agreement with Chiboug Copper Corp. Ltd. during the summer completed a program of surface exploration work on the latter's property.

An electromagnetic and self-potential survey was completed on all claims and, just previous to its dropping of the option, two deep holes were drilled but without any favorable results.

In the same township Opemisca Explorers Limited studied an electromagnetic anomaly situated one mile northeast of Springer lake. The two holes that were drilled indicated the presence of graphite in sedimentary rocks.

North of Opemisca mountain in Cuvier township Kerr Addison Mines Ltd. explored favorable areas outlined during the previous year by Prospectors Airways Company Ltd. Ten holes totalling 2,227 feet were reported to have cut pyroclastic rocks mineralized with pyrite and pyrrhotite.

In Dolomieu township Nisto Mines Ltd. provoked a rush of picketing (about 400 claims) after its discovery of chalcopyrite in felsitic strata in a serpentinized peridotite dike one mile north of Dolomieu lake.

b) West or Inconnu Lake Area

- 1963 -

No exploration work was reported in this area for 1963.

- 1964 -

Four miles north of Inconnu lake, in Branssat township, Phelps Dodge Company studied a magnetic anomaly during the summer season. Information from drilling revealed that the anomaly was caused by an iron-bearing (pyrite-pyrrhotite) sedimentary formation.

In Guettard township Patino Mining Corp. made a new study of two nickel showings along the La Trève Lake dike. Along the same dike but in Lamarck township Merrill Island Mining Corp. Ltd. visited another nickel showing.

c) Bachelor and Pusticamica Lakes Area

- 1963 -

Coniagas Mines Ltd. undertook in this area the most important surface exploration work of the year.

A 20-square-mile area having as its center the Coniagas workings in Lesueur township was covered by geological and geophysical surveys. Interesting sections were diamond-drilled and, as a result, a new zinc-silver-lead deposit was discovered a few thousand feet northeast of the company's ore zone. According to data obtained from about 13,500 feet of drilling distributed in 23 holes, the new zone would have an approximate length of 450 feet, a width of 506 feet and a minimum depth of 150 feet. A little farther east, Sturgeon River Mines Limited drilled, during the summer, seven holes to obtain information relative to the plunge of its gold deposit in Lesueur township.

In Letac township, Noranda Mines Ltd. drilled 4,250 feet on the S.D. Cooke claims. It is reported that the Nelligan-Benoît-Letac townships area was prospected during the summer by O'Brien Gold Mines Ltd. Noranda Mines Ltd. examined numerous base-metal and gold mineralizations in Ralleau and Effiat townships. Osisko Lake Mines Ltd. did geological surveys in Ruette township.

- 1964 -

As was the case for 1963, the most important surface exploration work was done by Coniagas Mines Ltd. Directly north of its workings in Lesueur township, this company completed a magnetic and self-potential survey on a two-square-mile area. Over 18 holes were drilled to study anomalies. Farther east, again in Lesueur township, Quebec Sturgeon River Mines Ltd. drilled two holes through a conductor situated one mile southeast of its gold-bearing deposit.

In Gand township, Mokta (Canada) Ltd. completed during the summer a magnetometric survey which it had inaugurated in October, 1963.

d) Aigremont Lake Area

For the first time in many years detailed exploration work was done in this part of the Province. Muscocho Explorations Ltd. completed an electromagnetic survey during the fall and drilled three holes that cut pyrrhotite-bearing gneiss outcropping west of Aigremont lake in the township of the same name.

3) South Sector - Doda and Barry Lakes Area

- 1963 -

The only work done during 1963 was reported by Quebec Smelting and Refining,which studied on surface a gold mineralization in Urban township.

- 1964 -

Two field parties were at work in this sector: Newconex Canadian Exploration Ltd. did a surface study of gold showings in the vicinity of Mina lake in Guercheville township and Urban Quebec Mines Ltd. made a new examination of its gold-bearing deposit close to Macho river in Urban township.

ROUYN - NORANDA DISTRICT

- 1963 -

Surficial exploration work was inaugurated on at least 125 mining properties and diamond drilling was done on half of them. The number of feet drilled - about 225,000 - showed a marked decrease compared with that of 1962, when more than 350,000 feet of drilling was completed.

In Bousquet township, Dumagami Mines Ltd. drilled 11,000 feet and outlined a gold-bearing zone having a length of about 1,800 feet in a shear zone containing parallel or en echelon lenses with variable widths. The average intersections assayed 0.20 ounce of gold a ton, 0.53 ounce of silver and 0.31% copper; a quantity of about 2,000 tons of ore is foreseen per vertical foot. New Alger Mines Ltd. and Norlex Mines Ltd. also bore drill holes in this area and obtained interesting intersections.

North Bordulac Mines Ltd. pursued a vast program of surface drilling on its property in Dasserat township. Interesting values were obtained and it was planned to deepen the shaft with a view to exploring in depth the gold-bearing zone.

Near Rouyn, South Dufault Mines Ltd. drilled about 25,000 feet and obtained copper values in an interesting structure.

Beattie-Duquesne Mines Ltd. completed 15 diamond drill holes on the old Duquesne gold-producing mine and obtained encouraging results.

In the Normetal region, New Metalore Mining Co. Ltd. did extensive work including geophysical surveys and more than 8,000 feet of diamond drilling.

In Cléricy township, United Obalski Mining Company Ltd. inaugurated a program of diamond drilling following summer-long work around Nos. 3 and 1 Harvie shafts. Interesting sections of high-tenor copper material could be followed. In the same township, Anaconda American Brass Ltd. inaugurated drilling work across a carbonated zone containing gold-bearing quartz veins.

Wiltsey-Coghlan Mines Ltd. completed work on its two properties in Dufresnoy and Rouyn townships. On its Dufresnoy property, adjacent to the Lake Dufault Mines Ltd. property, new drilling was done; on its Rouyn property, copper intersections of a commercial value were obtained.

Towards the end of the year, Northern Exploration Ltd. announced an intersection of 119 feet containing 20.2% zinc in Poirier township about 3 miles east of the Rio Algom Mines Ltd. property; at a later date other intersections containing zinc and copper were obtained. Following this discovery numerous companies acquired properties and inaugurated exploration work.

In Témiscamingue, mineralized zones were discovered, particularly in Baby township. Delhi Pacific Mines Ltd. acquired one of them toward the end of the year and obtained good copper and nickel values.

- 1964 -

Known drilling work from surface amounted to about 250,000 feet at the end of November, which amount is approximately the same as that for the same period of the preceding year. Exploration work was done on over 130 properties, including at least 74 programs of diamond drilling.

Joutel-Poirier Area

Northern Exploration Ltd. continued its intensive drilling program, which indicated 816,330 tons of ore containing 0.75% copper, 7.75% zinc and 1.10 ounces of silver a ton. These figures warranted the sinking of a shaft by the company. In addition to Northern Exploration Ltd., the main active company was Equity Explorations Ltd., which operated two drilling rigs and obtained intersections containing high copper tenors and minor quantities of silver, gold, and zinc.

Drilling in the area was done by at least 10 other companies but no significant results were obtained.

Rouyn Area

In addition to developing its deposit, Lake Dufault Mines Ltd. continued exploration of its property with surface drilling totalling close to 48,000 feet at the end of the year. Work was concentrated in the Norbec area, less than half a mile from the shaft.

Noranda Exploration Co. Ltd. completed a total of 28,514 feet of diamond drilling mainly in Montbray and Duprat townships, and on the New Lorie Mines Ltd. property in Dufresnoy township.

In Beauchastel township, Francoeur Mines Ltd. drilled a few holes with a view to exploring at a more considerable depth the center and west zones constituting, according to the consultant geologist of the company, an indicated reserve of 135,000 tons assaying 0.185 ounce of gold a ton and a probable reserve of 165,000 tons assaying 0.205 ounce a ton. At the end of the year 570,708 tons of ore had been brought up from the mine. Following encouraging results from drilling work the possibility of shipping ore to the future Wasamac Mines Ltd. plant is being considered.

Anaconda American Brass, Ltd. continued its program of diamond drilling inaugurated in 1963 in Cléricy township on a gold-bearing shear zone. During 1964, work was concentrated on a copper-bearing zone. The company mapped and took bulk samples of a gold deposit in Privat township.

Other programs of diamond drilling totalling from 3,000 to 5,000 feet were completed by Macdonald Mines Ltd. in Dufresnoy township, by Vauze Mines Ltd. in Duprat township and by Sullico Mines Ltd. in Montbeillard township.

Cadillac Area

East of Rouyn in Bousquet township, Dumagami Mines Ltd. proceeded with the exploration of a promising gold deposit discovered in 1963. Drilling was continued until August, 1964, when the total number of feet drilled amounted to 33,707. At the end of 1964, a study was being made on the tonnage, the tenor, the treatment methods and the commercial value of this deposit.

Novamines Corp. drilled a number of holes on the old gold-producing property of Central Cadillac Gold Mines Ltd. in order to verify heretofore unexplored sections.

Duparquet Area

In the Duparquet area, Beattie-Duquesne Mines Ltd. explored with deep drill holes in the old underground workings the copper zone on the Hunter property and discovered the presence of copper mineralization up to a depth of 1,650 feet.

VAL-D'OR - MATAGAMI DISTRICT

- 1963 -

Exploration work increased in this district during 1963. Diamond drilling or geophysical surveys or both were done on at least 143 mining properties. The corresponding figure for 1962 was 109.

This increase was caused by a sustained interest for gold, by the discovery of an important gold deposit on the Kiena Gold Mines Ltd. property during 1962 and by the discovery during 1963 of a new mine by Camflo Mattagami Mines Ltd. in Malartic township. Results obtained on mining properties in Dubuisson, Malartic, Louvicourt, and Vauquelin townships provoked new activity in previously neglected sectors of the region.

The main event of the year was the discovery of a gold deposit on the Camflo Mattagami Mines Ltd. property in Malartic township. A shaft was sunk to develop it. Drilling indicated 1,500,000 tons of possible ore with a tenor of average grade.

Drilling done by Kiena Gold Mines Ltd. on the frozen surface of Dubuisson lake increased the area of the known gold-bearing zone. This company sunk a shaft on one of the islands in the lake.

Diamond drilling on the Malartic Highgrade Gold Mines Ltd. property revealed the presence of a new deposit about half a mile south of the shaft.

At the Bevcon Mines Ltd. property in Louvicourt township, a narrow but rich gold-bearing vein was discovered in volcanic rocks.

In the Matagami Lake area, exploration work was continued, but at a reduced pace compared with that during the five previous years. Northern Quebec Explorers Ltd. bored drill holes in Isle-Dieu township in an interesting gold-bearing structure north of the main base-metal zones.

Properties where encouraging results were obtained, but on which supplementary work must be done to determine their value, are those of Chimo Gold Mines Ltd. in Vauquelin township, Cusco Mines Ltd. and Ultra-Shawkey Mines Ltd. in Dubuisson township, Courvan Mining Co. Ltd. in Louvicourt township, Black Cliff Mines Ltd. in Malartic township, Radiore Uranium Mines Ltd. in Isle-Dieu township, Western Quebec Mines Co. Ltd. in Vassan township, Consolidated Mogador Mines Ltd. in Fiedmont township and Northern Quebec Explorers Ltd. in Isle-Dieu township.

- 1964 -

While diamond drilling or geophysical surveys, or both, were done on 143 mining properties during 1963, the same kind of work was done on 201 properties in 1964. The number of mining properties upon which exploration work has been done has increased regularly each year since 1961.

The general expansion of economic activity throughout North America and Europe corresponded to a high demand and to higher prices for base metals and caused, for an appreciable part, the increase in exploration for mines. Mining operations were good with the exception of gold mines that remained stable and continued to be maintained by Federal Government subsidies. Fears, in early 1964, were later proven groundless that a colossal discovery by Texas Gulf Sulphur Co. Inc. in the Porcupine region would result in draining off towards Ontario exploration in northwestern Quebec.

Demand for base metals was so high that exploration work increased and spread over the whole region. Long-inactive exploration companies were re-activated and this contributed to the increase in the number of mining properties that were the object of exploration work during the year.

Two new discoveries were made during the year. Marbridge Mines Ltd. discovered, 3,000 feet from its deposit in LaMotte township, a nickel-bearing mass with a higher tenor. A new shaft is to be sunk to develop this discovery. Chimo Gold Mines Ltd. in Vauquelin township discovered a richer mineralization in the extension of an already-known gold-bearing zone and sank a shaft to continue underground exploration.

In Louvicourt township Courvan Mines Company Ltd. completed a two-year drilling program in a gold-bearing zone. Interesting results were obtained but had not yet been made available to the public by the company at the end of the year.

In Malartic township, Camflo Mattagami Mines Ltd. inaugurated underground work. The tonnage and tenor of the gold-bearing ore appear higher than was expected from earlier results of surface drilling.

In Fiedmont township, Consolidated Mogador Mines Ltd. continued its program of diamond drilling on its copper-nickel deposit. Work was mainly concentrated on the extension in depth of the mineralization.

In Tiblemont township Zulapa Mining Corporation Ltd. discovered a copper-nickel zone along the north limit of the leucodiorite stock. Copper-nickel sulfides are well disseminated in the contact zone of the stock.

In Senneterre township Transterre Explorations Ltd. did considerable diamond drilling during the year on its gold-bearing properties. Preliminary work revealed the presence of a long and wide gold-bearing zone, but work that followed did not give the favorable results that were expected.

In Wilson township, Mining Corporation of Canada (1964) Ltd. did a certain amount of work on a new gold discovery. The mineralized zone, which seemed to be long and wide, is cut in depth by a granite mass.

In Cuvillier township Consolidated Vauze Mines Ltd. and Sullico Mines Ltd. acquired properties covering new copper and gold discoveries but only minor surface work was done during the year.

In Louvicourt township Naganta Mining and Development Co. Ltd. and Black River Mining Ltd. obtained interesting results from diamond drilling for gold, but further work is necessary in order to determine the value of the properties.

In general, exploration in the Val d'Or - Matagami area was very active during 1964 and interesting results were obtained.

QUEBEC DISTRICT

- 1963 -

The publication of the Annotated Bibliography of the Metallic Mineralizations (S-72) and of maps B-790, 791 and 792 to the scale of 4 miles to the inch describing the metallic mineralizations in the Appalachians were responsible for greater interest being shown by mining companies and prospectors and resulted in an increase in prospecting and exploration in numerous townships of the Quebec area. More than 20 mining companies and an equal number of independent prospectors did exploration work in the Quebec Appalachian mountains.

a) Eastern townships

During 1963 Golden Age Mines Ltd. dug a few diamond drill holes on its Beauceville property. The pilot-plant was not used during the year. Company directors endeavored to gather funds for the construction of a commercial-scale plant.

In Melbourne township Kingsbury Asbestos Company, a subsidiary of Golden Age Mines Ltd. was optioned by Falconbridge Nickel Mines Ltd., which did diamond drilling on the serpentine mass.

Aylmer Mines Company Ltd., incorporated during the year, acquired an asbestos-bearing property in Coleraine township. The technical staff did a detailed geological study of the whole property, and following a magnetic survey, a program of diamond drilling was inaugurated.

In Gayhurst township, Molybdenum Corporation of America, which had optioned the molybdenite property of Copperstream-Frontenac Company in 1962, did no important work after the first months of 1963.

East Ventures Ltd., which owns many mining properties in the Eastern Townships, did considerable exploration and development work on a copper-bearing property in the St-Armand seigniory. These included principally geologic, electromagnetic, and geochemical surveys as well as diamond drilling.

Several mining companies did development work in the Eastern Townships, mainly in Sutton, Stukely, Roux, Rolette, Talon, and Panet townships.

b) Gaspé

Noranda Exploration Co. Ltd. did intensive research work in the Gaspé peninsula. It completed geophysical work and diamond drilling in many townships.

Terra Nova Explorations Ltd. was very active, and concentrated its work on exploration of two properties: one close to Chaleurs bay and the other in Lemieux and Lesseps townships, Gaspé-North county. Work consisted of surface prospecting, of geological, geophysical and geochemical surveys and of diamond drilling.

For the past few years Rio Tinto Canadian Exploration Ltd. holds a property in Lemieux township. During the summer of 1963, the company did geological studies and additional exploration drilling.

Sullico Mines Limited, which holds a special prospecting license since 1962, did much exploration work in the Provincial Gaspesia park. Diamond drilling revealed the presence in depth of a copper mineralization. At the end of the summer the company staked claims that were considered interesting.

Federal Metals Corporation was very active on its mining concessions in Lemieux township. Important exploration work, particularly diamond drilling, was done during that year.

Lemieux Copper Explorations Ltd., which obtained its letters patent during the year, holds many claims in Lemieux township. Systematic prospecting, stripping, detailed geological studies and magnetic surveys were made.

Richstone Mining Syndicate simultaneously explored two properties in Lemieux township. Prospecting, stripping and geological studies were made, followed by geochemical surveys. Diamond drill holes were dug in the most promising localities.

East-Macdonald Mines Ltd. owns the old Candego mine in Boisbuisson township. Only minor exploration work was done during the 1963 season.

Les Mines Bern-Or Limitée owns a group of claims in La Potardière township,Gaspé-North county, covering a lead showing. Exploration work included prospecting, stripping, and geological and geophysical surveys,as well as diamond drilling.

Newmont Mining Corp. of Canada proceeded during the year with its geological surveys in the center of the Gaspé peninsula. The company also visited numerous mining prospects.

Conwest Exploration Co. Ltd. completed geophysical surveys on its claims located in Lemieux township.

Numerous other companies, mining syndicates and prospectors did exploration work in Gaspé peninsula, particularly in Boisbuisson, La Potardière, Lemieux, Raudin, Newport, and Port-Daniel townships.

- 1964 -

The opening of the Gaspé park to prospecting during 1964 was welcomed by companies and prospectors. Close to 3,000 claims were staked within the limits of the park. Many exploration programs were inaugurated despite the high costs and the difficulties caused by a very rugged terrane. The sensational Timmins discovery that drew much attention from exploration companies failed to deter the latter from their work.

Groups interested in mining research in the Appalachians comprised over 32 exploration companies, a few mining syndicates and independent prospectors. A dozen among these worked in the Eastern Townships while the remainder concentrated their efforts in the Gaspé peninsula. Although the number of companies doing work in Gaspé peninsula shows an increase of over 100%, mining development still advances at a slow pace. This slow pace is explained by the fact that penetration is difficult: rugged topography, much impenetrable undergrowth, the presence of overburden everywhere, and the delicate nature of the technique for the discovery of deposits.

a) Eastern Townships

Golden Age Mines Ltd., Bornite Copper Corp. Ltd., Aylmer Mines Ltd., which in earlier years had discovered small asbestos deposits in the Eastern Townships, did a little exploration work on their properties and were mainly interested in finding funds for the development and mining of their deposits.

Beauce Placer Mining Co. Ltd. proceeded with new dredging and panning tests on gold-bearing alluvia covered, in part, by a layer of blue clay. On the one hand, the problem of handling clay had to be solved. In effect this material constantly slid back into the pond after having been dumped nearby. On the other hand, the problem of recovering gold adhering to clay particles had to be solved. The objective for 1963 was to eliminate all, or almost all, of the clay layer with the aid of a dragline and then to proceed with dredging and panning operations upstream along the pre-glacial channel. This procedure was contrary to what had been done during 1962. At the end of the season details of a mechanical and operational nature still were left to be perfected.

During the season, Rio Algom Mines Ltd. optioned the mining claims held by Copperstream-Frontenac Mines Ltd. in Gayhurst and Dorset townships. The company proceeded with a new bulk-sampling of the mineralized zones discovered by underground workings. Additional diamond drilling from surface was also carried out.

Labrador Mining and Exploration Co. Ltd. did systematic prospecting and geochemical, geological and geophysical work, as well as diamond drilling, on a molybdenite showing in range V, Whitton township, Frontenac county.

Molybdenum Corporation of America did prospecting, geological and geophysical work on its claims in Whitton township.

Territory Mining Co. Ltd. owns the old Eastern Metals Corp. Ltd. property in Rolette township where 7,000 feet of diamond drilling was done to determine the nature of certain conductors previously discovered by electromagnetic surveys, and to verify the presence of ore in the vicinity of the exploration shaft.

During the year, the Sullico group completed geochemical and geophysical studies in addition to exploration drilling in several districts of the Eastern Townships.

Lake Beaverhouse Mines Limited did magnetic and electromagnetic surveys, as well as exploration drilling, in Bolton and Hatley townships. The company reported the discovery of copper mineralizations.

Upton Copper Ltd. concentrated its exploration activities on dolomitic limestones impregnated with copper mineralizations in Upton township. A magnetometric survey and, later, an applied potential survey were done on lots 49 to 51, ranges XX and XXl. A program of diamond drilling, comprising at least 6,000 feet, was completed.

b) Portneuf

Ghislau Mining Company inaugurated in 1964 a program of diamond drilling with the aim of discovering ore on the extension of the Tétrault mine at Montauban. This company also did research work in the vicinity of nickeliferous pyrrhotite mineralizations in Montauban township, Portneuf county.

c) Gaspesia

During 1964, Gaspé Copper Mines Limited continued its development work on the copper deposit on Copper mountain. The program of bringing this deposit to the mining stage will necessitate the preparation of an open-pit and the addition of new facilities to the present treatment plant. Surface drilling and underground workings at Copper mountain indicated the presence of 19,000,000 tons of ore with an average tenor of 0.87% copper and of 12,000,000 tons with an average of 0.54% copper.

Gaspé Copper Mines Ltd. succeeded, since the end of 1963, in producing a concentrate containing from 54% to 57% molybdenum, about 38% sulfur and minor quantities of silicium, copper and lead. This concentrate is obtained by differential flotation, multiple cleanings and filtrations of the copper concentrate which contains about 27% copper and 0.25% molybdenum. The circuit where molybdenum is treated has a daily capacity of 500 tons.

Noranda Exploration Co. Ltd., a subsidiary of Noranda Mines Ltd., did considerable prospecting work in Gaspé peninsula, mainly in Bonnécamp and Boisbuisson townships. Geochemical and geophysical research, as well as diamond drilling, was completed.

Terra Nova Explorations Ltd., which has been very active in Gaspé peninsula during the last four or five years, concentrated its exploration work in several townships in the Gaspé Provincial park and in a few other townships surrounding it. The program, carried out with method and great technique, included a detailed geological mapping and geochemical, magnetic and electromagnetic, as well as self- and applied-potential, surveys.

Calvert Gas and Oil Company (head office in Oklahoma, U.S.A.) held early in 1964 a block of 54 claims in Lemieux township, Gaspé-North county. Geological, geochemical, magnetic and gravimetric surveys had been completed on these claims before their acquisition by the Calvert Company. This firm did about 7,000 feet of diamond drilling that led to the discovery of numerous copper-bearing intersections. An applied potential survey was completed with the aim of outlining copper-bearing zones and revealed the presence of numerous favorable zones.

Lemieux Copper Explorations Ltd. completed detailed magnetic maps on several groups of claims in Lemieux township.

McIntyre Porcupine Mines Ltd. did prospecting work, a detailed geological study and a geochemical survey on claims in Bonnécamp and Lesseps townships.

Sullico Mines Ltd. and Newmont Mining Corp. of Canada jointly did exploration work on two groups of claims in Lesseps township. Diamond drill holes were completed on claims held by Sullico after the renewal of a special research license. Geological and geochemical studies were completed on another block of claims southeast of the first group.

Anaconda Co. (Canada) Ltd. completed an applied potential survey on part of the property of Federal Metals Corporation.

During 1964 New Jersey Zinc Exploration Company (Canada) Ltd., which inaugurated its mining research work in Gaspé in 1961 when nickel mineralization was found at the common boundary of Lemieux and Courcelette townships, did geological, geochemical and geophysical surveys along this discovery. The mineralization extends over many square miles.

A new company, Gaspésie Mining Co. Ltd., was interested in searching for chrome-bearing deposits in the Mount Albert peridotite mass. Geological and geophysical surveys were used to outline favorable zones.

Syndicat des Pays-Bas did considerable exploration work on a block of claims in the northwest corner of Lesseps township. Aerial and ground magnetic surveys, accompanied by a geochemical study, were followed by stripping.

Conwest Exploration Company holds mining claims in Bonnécamp and Larivière townships. Geological, magnetic and geochemical surveys were completed.

Numerous other companies (Twin Mountain Uranium Mines Ltd., Osisko Lake Mines Ltd., Yellowknife Bear Mines Ltd., Leitch Gold Mines Ltd., Bathurst Silver Mines Ltd., Geophysical Engineering Exp., Span-North Mining Claims Ltd., etc.) inaugurated exploration work in Gaspé peninsula.

In conclusion, prospecting work was done by two mining syndicates and by a few prospectors. This work greatly helped the development of mines in Gaspé peninsula and should be mentioned.

MONTREAL DISTRICT

- 1963 -

Two areas of the Montreal district received much attention during 1963: the Landron Lake area in the northern part of the district and the St-Eustache - St-Canut area. In the first-mentioned region, various companies did preliminary exploration work on copper and gold showings. The re-opening to staking in 1963 of the St-Eustache - St-Canut area stimulated the search for sandstone and the study of the Potsdam Formation as a possible source of silica.

IRON

Hilton Mines produced at its full capacity during the year. The open-pit now attains a depth of 260 feet. During the spring the company drilled a total of 28,478 feet in the open-pit itself and close to its northern limit with the aim of obtaining a better outline of the deposit. This work was accompanied by a detailed petrographic study of the magnetic ore and of the enclosing rock. Magnetometric surveys were also completed on farms east of the mine. No anomaly was found that would warrant further work.

In April, 1963, American Chibougamau Mines Ltd. completed a magnetometric survey on a magnetite prospect on lots 20 and 21, range II, Hartwell township.

The anomaly indicated by this survey was afterwards diamond drilled to a total length of 737 feet. Assays showed a tenor of approximately 10% iron and 1% titanium.

TITANIFEROUS IRON

Diamond drilling was done on the Drummond Copper Corp. Ltd. and Tamara Mining Ltd. properties. Six holes totalling 731 feet were drilled in Wexford township: three of these, totalling 287 feet, were located in the northwest quarter of lot 15, range III; two, totalling 321 feet, were located in lot 22, range IV; whereas the sixth, 323 feet deep, was drilled in lot 23, range V.

A magnetometric survey on a 247-acre area was completed by the companies mentioned above on claims belonging to Donatien Mercier and A.F. Casselman in Wexford township.

In Beresford township, three holes totalling 102 feet were drilled during the summer season in the north half of lot 36, range V. Two other holes, totalling 72 feet, were drilled by J.M. Yates on lot 35 of the same range.

In Normand township, Laviolette county, 11 shallow holes, totalling 339 feet, were drilled on M. Hancock's claims.

LEAD AND ZINC

New Calumet Mines Limited is the only producer of lead and zinc in the Montreal district. Daily production amounted to 300 tons during 1963. In February and August, the company drilled four underground exploration holes on the Grand Calumet Mining property comprising lot 11, range III, Grand Calumet. Interesting values were obtained at the 1,925- and 2,050-foot levels. At the 1,925-foot level, an average width of 7.5 feet assayed 14.29% zinc, 3.47% lead, 0.006 ounce of gold a ton and 7.98 ounces of silver. At the 2,050-foot level, a zone averaging 11.5 feet in width gave 27.7% zinc, 8.6% lead, 0.036 ounce of gold and 14.75 ounces of silver a ton.

COPPER AND GOLD

Mining companies visited copper and gold discoveries in the Lake Landron area in the north part of Pontiac county. Over 1,100 claims, held by Selco Exploration Co. Ltd., Noranda Mines Ltd., Asbestos Corp. Ltd., McIntyre Porcupine Mines Ltd., Dome Exploration (Canada) Ltd., Quebec Cobalt and Exploration Ltd. and by the A.C. Thompson Syndicate were prospected. The greater part of this exploration work was of a preliminary nature. On the Thompson Syndicate property three holes totalling 1,007.5 feet were drilled. One of them cut disseminated chalcopyrite over a 19-foot length in gabbroic rocks. The average tenor was 0.45% copper. accompanied by minor values in gold. Furthermore, a magnetometric survey covering a 200-acre area on the syndicate's property in Devine and Chassin townships was completed.

MOLYBDENITE

J.M. Yates drilled two holes with a total length of 37 feet in the molybdenite prospect situated in the west half of lot 46, range IV, Kensington township.

NIOBIUM (Columbium)

During the month of June, 1963, Quebec Columbium Limited drilled two holes on its Oka property with a total length of 777 feet.

SILICA

The two plants owned by Canadian Silica Corporation Ltd. were in full production in 1963. At the end of 1962 and in 1963, the company acquired lands bordering its property. A program of diamond drilling outlined additional reserves amounting to 1,600,000 tons. Total reserves are presently valued at about 10,000,000 tons.

During the year Industrial Minerals of Canada Ltd., a subsidiary of Falconbridge Nickel Mines Ltd., staked a few claims in the vicinity of Saint-Canut. Exploration work and a limited amount of diamond drilling were completed in sandstone of the Potsdam Formation south of Montreal. Drilling was located mainly in Saint-Jean-Chrysostome parish,

In October, 1963, Corporation Administrative Services Ltd. staked seven claims covering 331 acres in Saint-Eustache parish, to study a silica property. Three holes totalling 298 feet, drilled in the Potsdam sandstone, revealed that iron oxides stain the sandstone and that the economic possibilities of the latter are not very favorable.

- 1964 -

IRON

Hilton Mines Company Ltd., in Bristol township, attained a new production record of 875,000 tons of pelletized ore for the year.

American Chibougamau Mines Ltd., inaugurated a program of valuation of iron formations in Houdet township. At least eight holes had been drilled at the end of the year and an area of 2,000 feet by 400 feet had been stripped by use of a bulldozer.

Iron is found in gneiss formations.

In the domain of titaniferous iron, limited activities took place in Wexford township where Tamara Mining Limited and Drummond Copper Corp. Ltd., proceeded with new drilling work. Black River Mining Ltd. acquired a property in the same area and one drill hole was completed.

LEAD AND ZINC

New Calumet Mines Ltd. decided to sink a 760-foot-deep internal shaft on the adjacent property known as Grand Calumet Mining Co. Ltd. During the year, New Calumet took control of Grand Calumet. From the 1,965-foot level the shaft will attain 2,685 feet. A recently-discovered, rich ore vein with an estimated reserve of 139,104 tons assaying 13.23% zinc, 4.06% lead,0.013 ounce of gold and 7.50 ounces of silver a ton will be mined. The company also undertook surface drilling with a view to studying parallel structures.

NIOBIUM (Columbium)

St. Lawrence Columbium and Metals Corp. Ltd. in Oka region attained a monthly rate of production of 200,000 pounds of niobium pentoxide. During the year 321,586 tons of ore was treated.

In the same area Quebec Columbium Ltd. collared two drill holes totalling 1,058 feet.

COPPER

In Décarie township, Noranda Exploration Ltd. drilled three holes totalling 532.6 feet with a view to exploring disseminated chalcopyrite mineralizations in biotite paragneiss and in an iron formation.

MOLYBDENITE

Kensington Moly Mining Co. Ltd. and Hupon Mining Exploration Corp. the former in Kensington township and the latter in Huddersfield township, collared shallow drill holes on their properties in search of molybdenite. On the other hand Quebec Molybdenum Ltd. completed geological, magnetometric and electromagnetic surveys in Huddersfield township.

SILICA

Industrial Minerals Ltd. studied the commercial possibilities on a silica deposit consisting of Potsdam sandstone in the Sainte-Scholastique area. According to the company's estimates, this deposit would contain 55 million tons assaying 99% silica. The quarry would be operated by a subsidiary, Indusmin Ltd. The company then acquired control of Canadian Silica Corp. Ltd., which operates a quarry at Saint-Canut, 10 miles from the Sainte-Scholastique deposit.

Other preliminary exploratory work in the search of silica was done by En-Ola Expl. Ltd. in Beauharnois seigniory, by Les Mines de Silice Supérieure in Brassard township and by Canadian Silica in Beauharnois township.

DEVELOPMENT AND MINING OPERATIONS
IN QUEBEC DURING 1963 AND 1964

This chapter contains a brief review of mining operations conducted in the Province of Quebec in 1963 and 1964. Only mining and development work are mentioned as general exploration work performed by mining companies has been treated in the preceding chapter of this report.

METALLIC MINES

AKASABA GOLD MINES LIMITED, Louvicourt Township - Abitibi-East

Production: gold, silver

Owing to the depletion of its reserves, Akasaba Gold Mines Limited closed down about May 9, 1963, after having shipped for treatment 31,184 tons of ore to the mill of Bevcon Mines Limited.

The ore, which contained an average of 0.1412 ounce of gold a ton, was drawn from stope No. 79, except 7,388 tons taken from stope No. 77.

There was no development work or diamond drilling carried out underground at this mine. On surface, a magnetic survey was made and three diamond drill holes were bored for a total of 1,678 feet without discovering further ore. In the year 1963, the mine had 17 employees under the management of H. Graham.

ANGLO AMERICAN MOLYBDENITE MINING CORPORATION, Preissac Township, Abitibi-East

Development: molybdenum, bismuth

At the beginning of 1963, Anglo American Molybdenite Mining Corporation replaced the small 2-drum hoist that operated by compressed air by an electric hoist having two drums with a diameter of 53 inches and a width of 36 inches. Installation of the new hoist was completed toward the middle of May 1963. A diesel-powered generator having a capacity of 312 kwa. was installed a short distance from the hoistroom in order to supply electricity for the 200 h.p. motor of the hoist.

About the first of June of the year reviewed, deepening of the 3-compartment vertical shaft was commenced at 370 feet. This work was completed in October at a depth of 770 feet. Three new stations were excavated at depths of 450, 600 and 750 feet. A permanent pumping station was established on the 750-foot level.

On surface, part of the overburden was removed from an area of about ten acres, this being the site on which the company plans to construct a plant for the treatment of ore.

The company does not report on any other development or exploratory work carried out during the year reviewed.

During 1964, underground development work included the driving of 1,627 feet of drifts of which 1,222 feet was driven at the 450-foot level and the remainder, at the 600-foot level.

Eleven diamond drill holes totalling 2,822 feet were completed underground from the 150-, 300-, and 450-foot levels. Furthermore, one 200-foot diamond drill hole was put down from the surface.

Other underground work consisted mainly of improvements in haulage drifts at various levels and of the preparation of loading pockets at the 700-foot level for production purposes.

On surface, the temporary headframe was replaced by a 96-foot-high permanent one. A new 84' x 64' twin drum electric hoist was installed in a building housing the compressors. A 25,000-volt power line was built as well as a sub-station for transformers.

During the year, a building containing a dry and various shops was erected. At the end of the same year, the construction of the concentrating plant with a daily capacity of 1,000 tons, of the crushing plant and of the bismuth refinery was almost completed.

Ore reserves were estimated at 3,070,000 tons containing 0.36% molybdenite and 0.053% bismuth.

At the end of 1964, 125 people worked at the mine. L. Dixon was the manager of the mine up to the middle of October; he was then replaced by J. Lavallée.

BARNAT MINES LIMITED Fournière Township, Abitibi-East

Producer: gold, silver

During the year 1963, Barnat Mines Limited treated a total of 575,555 tons of ore having a tenor of 0.108 ounce of gold a ton. The daily rate was 1,577 tons, as compared with 1,705 tons for the preceding year. About 930 tons a day was processed in the mill of Malartic Gold Fields Limited and the remainder, in that of the Barnat mine.

About 10% of the ore came from 17 stopes of the diorite zone located between the 525- and 1,575-foot levels. The remainder of the ore was derived mainly from 13 stopes of the porphyry zone located between the 900- and 1,250-foot levels, as well as from development work.

Drifting during the course of the year reviewed represented a total of 4,819 feet allocated on all levels between the 900- and 1,725-foot depths.but mainly on the 1,250-, 1,425- and 1,575-foot levels. On each of the 1,250- and 1,575-foot levels, a drift was advanced westward into the porphyry zone as far as the common boundary between this property and that of Canadian Malartic Gold Mines Limited.

Exploration work consisted in the driving of drifts in an east direction for about 1,750 linear feet on the 1,425-foot level. Drifts were completed on the 1,425-, 1,575- and 1,725-foot levels in order to develop the veins of diorite to the north of the main diorite zone.

Raises and sub-drifts for a total length of 1,618 feet in the diorite zone and of 3,768 feet in the porphyry zone were undertaken for the preparation of stoping and for ventilation.

Most of the underground diamond drilling was undertaken from the 350- and 525-foot levels in the diorite zone, from the 1,250- and 1,575-foot levels in the lower part of the porphyry deposit and from the 1,425-foot level in the east section of the mine. The total amount of underground drilling represents 47,717 linear feet. Twelve holes were put down from surface in the vicinity of the railroad, in the west part of the property. These drillings totalled 9,720 feet.

Ore reserves at the close of the year 1963 were estimated at 1,698,779 tons having a tenor of 0.117 ounce of gold a ton.

During 1964 this company mined a total of 581,266 tons of ore containing 0.114 ounce of gold a ton. Daily output was 1,588 tons compared to 1,577 tons assaying 0.108 ounce of gold a ton for the preceding year. About 890 tons was treated daily in the Malartic Gold Fields plant and the remainder,in the Barnat plant.

About 12% of the ore treated was mined from stopes in the diorite zone between the 525- and 1,575-foot levels. The remainder came from stopes in the porphyry zone at the 900-, 1,075- and 1,250-foot levels.

F2

Lateral development work totalling close to 3,500 feet of drifts and cross-cuts was done at the 1,250-, 1,425- and 1,725-foot levels. At the 1,425-foot level, the exploration drift was extended eastward to the limit of the property. At the 1,725-foot level, drifts were driven in diorites north of the main zone as well as a 1,250-foot-long exploration drift in a westerly direction.

Sub-drifts and ore-chutes were driven in the diorite zone at the 1,575- and 1,725-foot levels and in the porphyry zone at the 1,075- and 1,250-foot levels. This work represented a total length of 3,932 feet.

The main underground diamond drilling was done from exploration drifts at the 1,250-, 1,425-, 1,575-, and 1,725-foot levels. Diorites were also explored by diamond-drill holes at the upper levels. In all, 59,025 feet of diamond drilling was done. On surface, exploration of the main zone was continued with 4,858 feet of drilling.

At the end of 1964 ore reserves were estimated at 1,425,928 tons averaging 0.141 ounce of gold a ton.

In 1963, the mine employed about 200 persons and, in 1964, 178 persons. The manager was T.V. Nethery.

BEAUCE PLACER MINING COMPANY LIMITED, Rigaud-Vaudreuil Seigniory, Beauce

Production: gold.

Beauce Placer Mining Company Limited mines gold-bearing sand deposits along Gilbert river, in Rigaud-Vaudreuil seigniory. Work carried out on this property consisted in removing, by means of a dredge, clay that covered the gold-bearing sands. Activities were suspended in March 1963 because of the nature of the ground, which rendered operations too costly.

Dredging operations were resumed in June, 1964, and continued for the remainder of the year. A dragline dredge cleared clay in front of the regular dredge.

The quantity of material cleared off by the dredge amounted to about 6,000 cubic yards a day.

The manager was J. Crowdy.

BEVCON MINES LIMITED, Louvicourt Township, Abitibi-East

Production: gold, silver

In 1963, the treatment plant of Bevcon Mines Limited processed 248,450 tons of its own ore, which had a grade of 0.1256 ounce of gold a ton, in addition to 31,184 tons of ore derived from the mine of Akasaba Gold Mines Limited, which had a tenor of 0.1412 ounce of gold a ton. The total amount mined was 279,634 tons, as compared with a tonnage of 341,062 tons during the year 1962.

The ore from the Bevcon mine was drawn from stopes located between the 500- and 2,225-foot levels. About 19% of the ore was extracted from blocks of ground acquired from the Buffadison and Lencourt mines.

Development works comprising 3,456 feet of drifts and cross-cuts were carried out on almost all the levels between depths of 500 and 2,225 feet but mainly below the 1,150-foot level. Nearly 816 feet of drifts and cross-cuts was excavated on the 1,300-foot level in the west section of the mine. At the 2,225-foot level, drifts and cross-cuts were advanced in the western and northern parts of the mine for a distance of about 1,670 feet. The raises driven during the year under review, with a view to the preparation of stopes and ventilation of the mine, had a total length of 7,808 feet.

Underground diamond drilling amounted to 40,879 feet and served to explore veins, especially at the 1,300- and 2,225-foot levels. Twelve holes were drilled from surface on ground purchased from Buffadison.

Commencing in May 1963, after the closing down of the Akasaba mine, the rate of milling at the plant was reduced from 950 tons to 700 tons a day. At the end of the year, ore reserves were estimated at 361,392 tons grading 0.14 ounce of gold a ton.

During 1964, the quantity of ore treated in the plant amounted to 242,085 tons assaying 0.1343 ounce of gold a ton, with a daily average of 663 tons.

Ore was mined from various stopes between the 600-foot and 2,225-foot levels. About 35% of the ore came from blocks of land acquired from the Buffadison and Lencourt mines.

The main lateral development work including 4,860 feet of drifts and cross-cuts was made at the 1,300- and 1,450-foot levels in the Buffadison section, at the 1,600-foot level in the western part and at the 2,100- and 2,225-foot levels in the volcanic rocks north of the granodiorite mass. A small quartz vein with a high tenor in gold was mined during the year in volcanic rocks at the 2,225-foot level.

Most chutes and sub-drifts were driven between the 1,150- and 2,300-foot levels.

Underground diamond drilling totalled 32,397 feet and this work included the exploration of volcanic rocks from the 600-, 800-, 2,100- and 2,225-foot levels. On surface a magnetic survey was carried out at three different sections of the property; exploratory diamond drilling totalled 4,771 feet.

At the end of 1964 ore reserves amounted to 350,922 tons assaying 0.14 ounce of gold a ton.

During the course of the two years, the mine employed about 194 persons under the direction of H.R. Graham, manager.

BRUNEAU MINES LTD., McKenzie Township, Abitibi-East

Development work: copper

During the course of 1963, Bruneau Mines Limited gave a contract to R.F. Fry and Associates to carry out survey work with a view to the exploration of two zones of ore that were previously discovered through diamond drilling on its property in McKenzie township.

The work consisted in the cutting of an entrance and an adit, as well as two drifts in veins in Nos. 1 and 2 zones. The amount of drifting effected during the year reviewed was 999 linear feet.

Moreover, about 1,600 feet of diamond drilling was undertaken during the year.

In 1963 the mine manager was J.-M. Lafontaine.

In early 1964, the company completed development work inaugurated in September, 1963.

From the beginning of the year up until April when work ceased, 607 feet of drifts and 40 feet of raises were driven. In early April 1964, the portal and about 24 feet of a second adit were driven at a lower level.

In all 636 feet of underground drilling was done in the upper drift.

This work, employing about a dozen men, was under the direction of R.F. Fry and Associates; the consulting engineers were Messrs. McAdam and Flanagan, of Chibougamau.

CAMFLO MATTAGAMI MINES LIMITED, Malartic Township, Abitibi-East

Development: gold

This mine is 4 miles east in a direct line from Malartic. The construction of buildings, comprising a headframe, hoistroom, boiler-room and a combined cloak-room, office and repair shop, was commenced in July on the property of Camflo Mattagami Mines Limited. This installation is located 2 miles north of Highway 59.

On December 31, 1963, the 3-compartment shaft dug by the firm of E. Ross and Associates had attained a depth of 390 feet. Two stations were established at the respective depths of 150 and 300 feet.

In 1963, the mine manager was T.D. Anderson.

The shaft, which was 390 feet deep in early 1963 was completed at the end of August, 1964, at the 1,036-foot level. Stations were cut at 150-foot intervals.

At the 300-foot level, a 125-foot-long drift was driven to the emergency exit. At the 450-foot level, drifts give access to zone No. 1; at the 750-foot level, they give access to zone Nos. 1, 2 and 3 and at the 600-foot level reach zone Nos. 1 to 6. The total length of newly driven drifts attains 5,785 feet. At year end, 19,000 tons of ore from these works were accumulated on surface.

Chutes driven for ventilating purposes and for emergency exits totalled 600 feet. Located in the No. 1 zone, they were completed between the 600- and 450-foot levels and between the 300-foot level and the surface. The chute driven from the 450-foot level was not completed.

E. Ross and Associates,who sunk the shaft and were in charge of the development work, employed 45 men at year end. The mine itself, managed by S.C. Brown for about the past six months, employed 11 persons.

CAMPBELL CHIBOUGAMAU MINES LTD., Obalski, McKenzie and Roy Townships,
Abitibi-East

Production: copper, gold, silver

Campbell Chibougamau Mines Limited exploits a deposit in Obalski, McKenzie and Roy townships, Abitibi-East county. During the course of the year reviewed, this enterprise produced concentrates containing 30,697,169 pounds of copper, 28,583 ounces of gold and 218,106 ounces of silver. These metals were recovered from a total of 833,286 tons of ore containing an average of 1.95% copper, 0.042 ounce of gold and 0.354 ounce of silver a ton. The milled ore was derived from four mines:

Main mine	348,006 tons
Kokko Creek	26,195 tons
Cedar Bay	147,931 tons
Henderson	311,154 tons

The concentration mill, situated at the Main mine, treated an average of 2,283 tons of ore per calendar day and recovered 94.46% of the copper metal contained in the ore. The concentrates, which were shipped to the smelter at Noranda Mines Limited, carried an average of 24.56% copper.

The outstanding events of the company in the year 1963 were the following: at the Cedar Bay mine, the development of the 950- and 1,250-foot levels following the sinking of the shaft in 1962; at the Henderson mine, advancing of a drift that gave access to the ore of the "A" zone at the 650-foot level; additional drifting on the 275-, 410- and 525-foot levels and the excavating of an internal shaft from the 275-foot level to that of the 525-foot level in order to facilitate preparatory work of the "B" zone in the east part of the property; at the Kokko Creek mine, the establishing of a new level by deepening of shafts and the recovery of 25,000 tons of ore at that depth.

Proved ore reserves of the company amounted to 3,032,401 tons, grading 2.21% copper and 0.061 ounce of gold a ton at the close of its fiscal year, that is June 30, 1963, according to reports of the company.

The enterprise was employing 749 persons at the close of the year 1963.

1) Mining: a) Main mine

The amount contributed to the total ore mined by the Main mine was 348,006 tons grading 1.44% copper and 0.037 ounce of gold a ton. This ore was drawn during the mining of stopes in the vicinity of the No. 1 shaft and from the zone served by the internal shaft.

b) Kokko Creek mine

The Kokko Creek mine was responsible for 26,195 tons of ore containing 3.08% copper and 0.013 ounce of gold a ton. This ore was mined by R.F. Fry and Associates.

c) Cedar Bay mine

A total of 147,931 tons of ore drawn from the Cedar Bay mine and assaying 1.98% copper and 0.060 ounce of gold a ton was mined and milled. The ore was transported by truck to the mill of the Main mine.

d) Henderson mine

A total of 311,154 tons of crushed ore grading 2.42% copper and 0.042 ounce of gold was shipped from the Henderson mine to the mill of the Main mine. The ore was drawn from the "A" zone and the "B" zone.

2) Preparatory work and exploration

Main mine

A total of 763 feet of drifts and 546 feet of raises was cut at the Main mine during 1963. The diamond drilling carried out at this mine consisted in 1,458 feet bored from surface and 35,073 feet from below ground.

Kokko Creek mine

Development work at the Kokko Creek mine was made up of 63 feet of shaft sinking, 142 feet of drifts, 2,076 feet of diamond drilling from surface and 5,225 feet of boring from underground.

Cedar Bay mine

At the Cedar Bay mine there was completed 4,412 feet of lateral drifting, 991 feet of raises, 65,078 feet of diamond drill holes from underground and 3,413 feet from surface.

Henderson mine

The work undertaken at the Henderson mine consisted in the cutting of 10,647 feet of drifts and 2,164 feet of raises, as well as 7,372 feet of drilling from surface and 59,830 feet from below surface. The greater part of the work done consisted in extending, on the 275- and 525-foot levels, the drifts of the "A" zone toward the section of the "B" zone, where an internal shaft was established.

The internal shaft has a total depth of 328 feet and terminates at the 525-foot level.

In 1963, the mine manager was K.C. Wilson.

During 1964 the company produced concentrates containing 31,046,751 lbs. of copper, 30,130 ounces of gold and 198,210 ounces of silver from a total of 896,706 tons of ore averaging 1.84% copper, .042 ounce of gold and .307 ounce of silver a ton. Ore treated was mined from the four mines mentioned above.

The concentrating plant treated daily an average of 2,450 tons and recuperated 94.21% of copper metal. Concentrates contained an average of 23.37% copper.

At the end of the fiscal year, on June 30, 1964, proved and probable ore reserves, as reported by the company, were as follows:

Proved: 2,868,390 tons at 2.16% copper
Probable: 6,322,205 tons at 2.27% copper.

The mine employed 687 men at the end of 1964.

1) Mining: a) Main mine

This mine produced 344,733 tons assaying 1.55% copper and and 0.030 ounce of gold a ton. Most of this ore came from stopes in the zone serviced by the internal shaft.

b) Kokko Creek mine

This mine contributed 19,701 tons assaying 1.76% copper and 0.014 ounce of gold a ton.

c) Cedar Bay mine

A total of 185,876 tons of ore assaying 1.99% copper and 0.055 ounce of gold a ton was mined.

d) Henderson mine

A total of 346,396 tons of crushed ore assaying 2.05% copper and 0.050 ounce of gold a ton was shipped from this mine to the plant at the Main mine. This ore came from A and B zones.

2) Development and Exploration Work

1) Main mine

At the Main mine, 41 feet of raises was driven during 1964 and 19,311 feet of diamond drilling was done from underground workings.

2) Kokko Creek mine

A total of 962 feet of underground diamond drilling was done.

3) Cedar Bay mine

Work included 3,185 feet of lateral work, 470 feet of raises, 22,955 feet of underground diamond drilling and 1,379 feet of diamond drilling from surface.

4) Henderson mine

At this mine 3,235 feet of drifts and 725 feet of raises in the area serviced by the main shaft were driven; 1,969 feet of drifts and 384 feet of raises were driven in the zone serviced by the internal shaft as well as 16,609 feet of underground diamond drilling.

Development work at the Henderson mine consisted mainly in clearing and preparing "B" deposit and in digging excavations for installing the hoist of the underground shaft and of the electrical wiring necessary for its operation.

In 1964 E.C. Wilson was the general manager (mines) of the company.

CANADIAN MALARTIC GOLD MINES LIMITED, Fournière Township, Abitibi-East

Producer: gold, silver

During the course of the year 1963, the mill of Canadian Malartic Gold Mines Limited treated 330,434 tons of ore grading 0.093 ounce of gold a ton, as compared with 395,406 tons containing 0.086 ounce of gold a ton for the preceding year. In addition, a total of 141,264 tons of nickel-bearing ore was treated in this plant for Marbridge Mines Limited.

The exploration stopes were distributed between the 125- and 1,250-foot levels. The "North Main", "708", "708E", "D" and "F" zones supplied about 93% of the ore; the remainder was derived from the "Porphyry" and "J" zones and also from the "701" vein.

All this work from below surface was undertaken with a view to the preparation of stopes. These works represented a total of 1,772 feet of drifting and 1,335 feet of raises completed in the "North Main", "708", "708E", and "F" zones.

Only one hole was drilled from surface and that was in the "F" zone. Most of the diamond drilling from underground served to outline the stopes of the zones mentioned above. Borings were also effected in the vicinity of stopes Nos. 1L, 26, 41 and 48, as well as in the neighborhood of the greenstone contact, starting from the 1,250- and 1,575-foot levels of the Barnat mine.

Ore reserves, at December 1963, were estimated at 199,585 tons grading 0.095 ounce of gold a ton.

During 1963 the mine employed an average of 179 persons, who were under the direction of A.R. Meyers, manager.

During 1964, the plant treated 329,388 tons of ore assaying 0.107 ounce of gold a ton. Towards the end of the year, mining operations had almost terminated; however a daily tonnage of 900 tons was maintained, with a markedly higher grade of ore.

Nickel ore from the Marbridge mine is still treated.

Stopes worked during 1964 are distributed between the 80-foot and the 1,250-foot levels. They are scattered in zones and veins F, 26W and 26N, 48, 49, 50, and 701, as well as in the pillar of No. 3 vein. Ore was mined from these stopes as well as from those in veins Nos. 12 and 30 and from pillars in veins D and No. 708.

There was no development work done and the only notable drilling was advanced towards stopes of the Sladen section of Barnat mine with a view to facilitating water flowage in that direction.

During 1963 and 1964, the manager of the mine was A.R. Meyers.

CHIMO GOLD MINES, LIMITED, Vauquelin Township, Abitibi-East

Development work: gold

Excavation work for the shaft opening, begun late in July, 1964, was completed towards the end of October to a depth of 102 feet.

At year end, a 110-foot headframe was erected and its covering was begun.

Meanwhile, the following buildings had been erected: hoist room, diesel generator room and mechanics' shop combined; boiler room and electricians' shop combined and, lastly, a building containing offices, dryhouse and warehouse. Furthermore the diesel generators and portable compressors, as well as the boiler and the hoist, were installed.

An access road about 7.5 miles long connects the property with Highway 58 at about 3.5 miles south of Louvicourt.

According to the interpretation of results from surface drilling, temporarily discontinued in April, ore reserves were estimated at 174,000 tons assaying 0.47 ounce of gold a ton (high values non-diluted), from surface to a depth of 250 feet, or about 700 tons of ore per vertical foot.

Shaft sinking was done by J.S. Redpath Ltd. The manager of the mine was D.G. Valentine.

THE CONIAGAS MINES LIMITED, Lesueur Township, Abitibi-East

Production: zinc, lead, silver

The mill of The Coniagas Mines Limited processed an average of 305 tons of ore a day during 1963. The tenor of the ore treated was 13.7% zinc, 1.68% lead and 7.99 ounces of silver a ton.

The treated ore was extracted from stopes distributed between surface and the 790-foot level.

Lateral development comprised 1,629 feet of drifts, of which total an important part was completed on the 944-foot level. Raises, having a combined length of 1,098 feet, were established in preparation of stopes, ventilation of the mine, emergency exits, etc.

It is reported that a new zone of ore, probably situated about 1,000 feet northeast of the principal vein, was discovered in the course of diamond drilling that was being carried out from the surface.

The total amount of diamond drilling done from surface in 1963 represents 10,659 feet. This diamond drilling, undertaken for the purpose of underground exploration, totalled 17,804 feet of holes.

Toward the close of the year reviewed here, the mill was enlarged slightly in order to install a ball-mill having a capacity of 525 tons of ore a day. This new crusher will increase the daily capacity of the mill.

After the mining of 111,418 tons of ore in 1963, ore reserves of the mine at the end of December represented a total of 196,000 tons grading 8.19% zinc and 3.91 ounces of silver a ton.

The number of employees at the mine in 1963 was about 125. These employees were under the management of J.R. Harrison.

During 1964, the plant treated daily an average of 313 tons of ore grading 9.57% zinc, 0.72% lead and 3.68 ounces of silver a ton.

Fifteen stopes distributed at all levels of the mine contributed to the total ore treated: however, the fourth, or 625-foot level, stope contributed alone close to half of it.

A total of 6,045 feet of drifts was driven mainly at the 325-, 625-, and 1,100-foot levels. Raises totalling 3,757 feet were driven for various purposes, 802 feet of which was for use as ore or sterile chutes.

Holes totalling 7,501 feet were drilled from surface.

Important events of the year were the accelerated tempo of the underground development work; the discovery of numerous ore lenses of various tonnage and grade in the northern part of the mine and the installation of a ball crusher in order to increase the daily output.

At the end of the year ore reserves, according to the company, totalled 283,735 tons assaying 8.25% zinc and 3.58 ounces of silver a ton. In 1964 there were 130 employees under the management of J. Knuckey.

CON-SHAWKEY GOLD MINES LIMITED, Dubuisson Township, Abitibi-East

Development: gold

Shaft No. 2 was emptied at the beginning of 1963 and, following that, zone No. 10 was tested through drilling starting from the existing stations found at respective depths of 250, 400, 550 and 700 feet.

In June of the year reviewed, the firm of McIsaac Mining and Tunnelling Company commenced the excavation of cross-cuts on the 250- and 700-foot levels toward the No. 10 zone which is situated to the south of the No. 2 shaft and follows a general east-west direction. The work then followed a vein of this zone toward the east.

A sample taken from this vein and weighing in the vicinity of 300 tons was shipped to the treatment plant of Malartic Gold Fields Limited. An assay of the sample showed that its gold content was very low.

Testing of the zone by diamond drilling was carried out from surface, especially on the ice of Thompson river.

Toward the close of the year, the underground workings were abandoned. However, the surface buildings were maintained in good condition and drilling continued from surface.

R. Bradshaw was the manager of this company.

CONTINENTAL TITANIUM CORPORATION, Electoral District of Charlevoix,
Charlevoix

Producer: ground ilmenite, crushed ilmenite, concentrated to 45% TiO_2

At the beginning of April, 1963, exploitation was renewed at the Fourneau mine by Continental Titanium Corporation which resulted in the recovery of 2,000 tons of ore up to June 18th. During the month of June, the Bignell mine was worked with a weekly production of 1,000 tons of ore.

Later on, a total of 1,200 tons of ore was drawn from the Fourneau mine, with work lasting nearly two weeks.

Finally, activity was concentrated at the DuPont mine, which is located between the Bignell and the Coulomb-Ouest mines, and from which was shipped approximately 3,000 tons of ore. This was effected while in the process of making discoveries and doing preparatory work with a view to enlarging the mine.

In the Coulomb Ouest mine, which had been flooded, dewatering was effected and about 2,000 tons of ore was mined.

During the year under review, shipments amounted to about 26,000 tons of ground, crushed, concentrated and crude ore.

Manager: N. Sol培ducha, vice-president.

In 1964 operations were mainly conducted in the DuPont mine with an average weekly production of 1,500 tons of crude ore.

In the Bignell mine, operations were intermittent, with a weekly production varying between 200 and 300 tons.

Furthermore, 800 tons of ore was extracted from the General Electric mine.

Development work was done in the Fourneau mine, notably the ventilation shaft and the drilling of a first series of blast holes so that the mine be ready for operation when necessary.

Diamond drilling with core recuperation was done in and around the DuPont mine for a total of 1,000 feet, in order to determine the specific weight of the ore, which was established at an average of 4.48.

In the plants, crushing and concentrating are still done with the purpose of obtaining ore with fine or coarse granulations.

Mining of crude ore amounted to 36,051 tons in 1964 and shipments totalled 23,672 tons.

The manager was M. Zwonok.

COPPERSTREAM - FRONTENAC MINES LIMITED, Gayhurst Township, Frontenac

Exploration: molybdenum

Copperstream-Frontenac Mines Limited concluded an agreement with Molybdenum Corporation of America with a view to continuing the exploratory work directed at developing the molybdenite deposit situated on lots 17 and 18, range IX, Gayhurst township. A total of 3,000 feet of diamond drilling was completed starting from an adit. Operations at the mine were suspended in February 1963. Exploratory work proved the presence of 2,000,000 tons of molybdenum ore having an average grade of 0.5% MoS_2.

The manager was Gordon McLeod.

In 1964 an agreement was signed between Copperstream-Frontenac Mines Limited and Rio Algom Mines Limited by virtue of which the latter continued exploration work. For this purpose, a certain quantity of ore was mined from the drift and shipped as a sample to the pilot plant of the Department of Natural Resources, Quebec City. Diamond drilling was done from the surface.

Rio Algom Mines Limited finally abandoned the property at year end.

The manager was C. Amyotte.

LA SOCIÉTÉ MINIÈRE CUPRA LIMITÉE, Stratford Township, Wolfe

Underground exploration: copper, zinc, gold, silver

During the course of the year 1963, La Société Minière Cupra Limitée carried out exploration work on a copper, zinc, gold and silver deposit situated on lot 5, range VI, S.W. in Stratford township.

The work at this property consisted in the sinking of a 3-compartment shaft to a depth of 2,250 feet and the establishing of 16 stations at intervals of 125 and 150 feet. This shaft-sinking was terminated on December 10, 1963.

A program of diamond drilling was carried out from the 12 and 13 levels.

In 1964 the company executed drifting work necessary for the mining of its deposit.

These works consisted in driving access drifts to the ore zone on the 15 levels and in digging ventilating, ore, and sterile chutes between these levels and the surface.

The deposit dips 42° south. Its known length is 3,370 feet between the surface and the 15th level, a vertical height of 2,063 feet. Its width is 385 feet and its average thickness, 6 feet.

Above the 10th level, reserves are estimated at 1,014,000 tons grading 3.25% copper, 3.03% zinc, 0.51% lead, 0.02 ounce of gold and 1.18 ounces of silver a ton.

In 1963 and 1964, the manager was R.B. Gosselin.

EAST MALARTIC MINES LIMITED, Fournière Township, Abitibi-East

Producer: gold, silver

The mill of East Malartic Mines Limited treated, during 1963, a total of 507,003 tons of ore at the rate of 1,400 tons a day. The average tenor of this ore was 0.155 ounce of gold a ton. The quantity of ore processed in the preceding year was 551,158 tons grading 0.158 ounce of gold a ton.

The ore reserves, as estimated at the close of the year under review, amounted to 1,680,943 tons containing 0.161 ounce of ore a ton. During the preceding year, ore reserves were set at 1,835,079 tons having a tenor of 0.164 ounce of gold a ton.

Once again about 60% of the ore was derived from the main zone. The active stopes of this zone are situated principally between the 2,485- and 3,985-foot levels. The remainder of the ore was drawn mainly from the East zone on the 2,935-foot level.

Several exploration stopes were also prepared during the year reviewed. In the principal zone, these stopes are located on the

2,335-foot level and between the 3,445- and 4,245-foot levels. In the East zone, they are located between the 2,935- and 3,805-foot levels.

Lateral development work and diamond drilling were carried out on the east side on the 3,445- and 4,845-foot levels.

On the 4,245-foot level, a drift was advanced toward the east, but diamond drilling was done only in the west drift. On the 4,095-foot level, drifting and drilling were both carried out on the west side. In fine, the West drift was completed on the 4,845-foot level as far as the Sladen zone, where some diamond drilling was effected.

The ore chute of the No. 5 shaft was completed from the 4,545-foot level to the 3,945-foot level, and that of the No. 4 shaft was renovated between the 3,805- and 3,625-foot levels. An excavation was also made for the installation of a jaw-crusher below the 3,805-foot level.

In 1963 the mine had 445 employees.

In 1964 the plant treated 470,122 tons of ore assaying 0.157 ounce of gold a ton, with a daily average of 1,284 tons, compared to 1,389 tons a day containing 0.155 ounce of gold a ton for the preceding year.

The Main and East zones each contributed half of the ore treated. In the Main zone, stopes were distributed between the 2,485- and 4,245-foot levels. The most active part of this zone was close to the No. 5 internal shaft. In the East zone, stopes at the 2,935-, 3,445- and 3,805-foot levels contributed the greatest part of the ore. During the year numerous stopes were prepared for mining in this zone. Towards the end of the year, the East zone contributed close to 70% of the ore.

Exploration drifts and cross-cuts were driven over a distance of 2,718 feet at the 2,035- 2,485-, 4,245-, 4,545- and 4,845-foot levels in the East zone and at the 4,545-foot level in the Main zone.

Driving of drifts, sub-drifts and chutes for the preparation of stopes totalled 17,830 feet, mainly in the East zone between the 2,935- and 3,805-foot levels. Service raises were driven between the 3,445- and 2,935-foot levels in the East zone and between the 4,095- and 3,805-foot levels in the Main zone. A ventilating raise to connect the 2,485-foot level with the 2,035-foot level was almost complete at the end of the year.

Underground diamond drilling totalled 66,814 feet and included, namely, the exploration of the upper part of the East zone from the 2,035- and 2,485-foot levels, the exploration of the eastern part of the same zone between the 3,085- and 3,805-foot levels as well as the exploration in depth of the East zone from the 4,845-foot level. In the Main zone, drilling was done close to the No. 5 shaft, from the 4,545-foot level.

During the year the jaw-type crusher at the 2,785-foot level was set up under the 3,805-foot level, close to the No. 4 shaft. Improvement was also made to the main ventilating raise in that part of the mine.

At the end of 1964 ore reserves were estimated at 1,558,254 tons averaging 0.156 ounce of gold a ton. The mine employed 410 persons under the management of T.V. Nethery.

EAST SULLIVAN MINES LIMITED, Bourlamaque Township, Abitibi-East

Producer: copper, zinc, gold, silver, cadmium

During the year 1963, East Sullivan Mines Limited treated in its mill 2,760 tons of ore a day for a total of 1,007,046 tons containing on the average 0.633% copper, 0.145% zinc, 0.0045 ounce of gold and 0.167 ounce of silver a ton. The quantity of ore processed daily during the preceding year was less, being 2,655 tons, but the content of metal was higher.. There was a renewed production of cadmium during the year, the output being 8,614 pounds.

Important quantities of ore was drawn from zones "A", "B", "C", "J", "Q", and "R". Other places from which the ore was mined were the "G", "H", "L", "M", "P", "S", "U", "V", "W", "X" and "Y" zones. Zones "A", "B" and "W" are now all open at the surface. In zones "G", "P" and "R" ore is still being mined, but the stopes themselves are inactive.

In addition to the intermediate drifts cut in the "B" and "Q" zones, drifts were pierced on the 600-foot level in the "X" zone, on the 1,050-foot elevation and the 1,200-foot one in the "V" zone, on the 750-foot level in the "B" zone and on the 150-foot level in the "W" zone.

At these last two places the zone was tested by diamond drilling. Finally, testing was also done on the 1,350-foot elevation at the limit of the "Q" zone.

As of August 31, 1963, the date which closed the fiscal year of the company, ore reserves amounted to 1,560,000 tons containing an average of 0.84% copper and 0.25% zinc.

The total number of employees was 260.

During 1964 the plant treated daily 2,710 tons of ore for a total of 988,023 tons containing an average of 0.53% copper, 0.32% zinc, 0.0045 ounce of gold and 0.169 ounce of silver a ton. In the preceding year, the copper value exceeded 0.633% and the daily output of the treatment plant was 2,760 tons. A total of 2,114 pounds of cadmium was extracted.

The following stopes contributed to the total ore mined: "A" and "B" at the 900-foot level, "V" at the 1,350-foot level, "Q" and "Y" at the 1,650-foot level, and "S" at the 3,150-foot level. In the "C", "J1", "J2", and "R" stopes, located between the 600- and 2,550-foot levels, ore is still mined.

Mining operations are now at the recovery stage. There were no underground or surface drillings, nor lateral development work.

As at August 31st, 1964, which is the end of this mine's fiscal year, ore reserves amounted to about 1,177,000 tons containing 0.7% copper, 0.19% zinc, 0.005 ounce of gold and 0.14 ounce of silver a ton.

The total number of employees was 249. The manager was O.R. Wray.

GASPÉ COPPER MINES LIMITED, Holland Township, Gaspé-North

Exploration underground and open-pit: copper, gold, silver, bismuth, molybdenite, selenium

Gaspé Copper Mines Limited mines a copper, gold, silver, bismuth, molybdenum and selenium deposit in Holland township and operates a treatment plant with a daily capacity of 6,000 tons.

The property comprises two main deposits: that of Needle mountain and that of Copper mountain.

During the course of the year 1963, the total quantity of rock mined was 4,873,481 tons, of which 2,778,349 tons was ore.

The following table is a summary of the work performed in 1963 in relation to that done in 1962.

Ore mined	1962	1963
Zone "A"	1,063,276 tons	935,442 tons
Zone "B" center	429,285 "	451,966 "
Zone "C" center	1,129,974 "	1,076,140 "
Zone "B" east	28,454 "	164,439 "

Ore mined (cont'd)	1962	1963
Zone "D" center	1,150 tons	13,943 tons
Drifting	168,182 "	136,419 "
Total	2,820,321 "	2,778,349 "
Drifts	8,034 feet	11,060 feet
Raises	940 "	898 "
Inclined roadways	2,373 "	1,823 "

Exploratory work conducted on the deposit of Copper mountain was executed on the 1,500-foot elevation, and from surface. This work consisted in 505 feet of raises and 1,000 feet of drift, as well as the removal of 424,110 tons of sterile rock on surface, by way of exposing the deposit.

Most of the work was carried out in the Needle Mountain deposit where three zones, the "A", "B" and "C", were being exploited. These zones supplied respectively 33.7, 22.1, and 38.7% of the total quantity of the total ore mined. The remainder, which amounted to 5.5%, came from development headings and from zone D.

In the "A" zone mining was effected by the open-pit method. In the other zones, the shrinking and pillar method was employed while making use of diesel-powered machinery.

Mining of the ore in the open-pit workings was carried out on the benches at elevations of 2,300, 2,340 and 2,380 feet above sea-level.

The quantity of rock broken was 2,452,266 tons, of which amount 935,442 tons was ore. This is a decrease of 7% when compared with the quantity extracted the preceding year.

The amount of ore drawn from the "B" zone, which represents the central and east sections, was 616,405 tons. Development headings were established in the east section. They consisted in the excavation of drifts and raises necessary to the mining operations and the ventilation on the 1,400- and 1,700-foot levels and in exploratory drifts on the 1,800-foot elevation.

Zone "C" supplied 1,076,140 tons of ore, this being a slight decrease when compared with the amount mined during the preceding year.

Development headings conducted in this zone consisted in the excavation of the main inclined roadway above the 1,800-foot level and also the digging of the drifts and raises necessary to the recovery of ore. Exploratory drifts were cut above this zone on the 1,800-foot elevation in order to allow the carrying out of a program of diamond drilling so as to assess the deposit at that depth.

In 1964, most work was done in the Needle Mountain deposit, which includes two main sections: Central and East. The former is divided into three zones: A, B and C.

Stripping of overburden and of steriles that covered the Copper Mountain deposit was continued from early June up to October in order to prepare the location for open-pit mining.

During 1964 the total quantity of rock mined was 5,263,207 tons, of which 2,849,951 tons was ore.

The following comparative table summarizes work done in 1963 and in 1964.

Ore mined	1963	1964
Zone "A"	935,442 tons	1,157,437 tons
Zone "B" (center)	451,966 "	346,687 "
Zone "C" (center)	1,076,140 "	1,032,549 "
Zone "B" (east)	164,439 "	232,639 "
Drifting	136,419	80,639 "
Total	2,764,406 tons	2,849,951 tons
Drifts	11,060 feet	7,078 feet
Raises	898 "	1,727 "
Inclined roadways	1,823 "	1,677 "
Ore treated	2,676,000 tons	2,725,300 tons
" " daily	7,332 "	7,446 "
Grade in copper	1.26%	1.24%
Ore reserves	54,866,000 tons	66,297,000 tons
Grade in copper	1.20%	1.06%

A total of 246,029 tons of concentrate and of flux, comprising 51,640 tons of concentrate coming from Maritimes Mining Corporation Limited (37,904), Atlantic Coast Copper Corporation Limited (9,842), Heath Steele Mines, Limited (1,466), and Consolidated Rambler Mines, Limited (2,228), was treated in the smelter to produce 43,320 tons of copper, 11,350 ounces of gold, 521,000 ounces of silver, 58,000 lbs. of bismuth, 44,500 lbs. of molybdenum and 42,400 lbs. of selenium.

In the zone A open-pit, mining was done on benches at the 2,300-, 2,340-, 2,380-, 2,420-, 2,440-, and 2,500-foot elevations above sealevel. The total amount of rock mined was 2,633,844 tons, of which 1,157,437 tons of ore assayed an average of 0.72% copper or 41% of the total. This represents an increase of 23% over the amount mined during the preceding year.

Work done in the B zone: Central, B-5 and East, gave 579,326 tons with an average grade of 1.06% copper for B Central, 1.29% for B-5 and 0.93% for B-East, which is 20% of the total amount of ore. This represents a decrease of 6% from the amount mined during the preceding year. Drifting was done in the B zone (East) consisting in the driving of drifts and raises needed for mining and ventilating on the 1,400- and 1,700-foot levels.

In the C zone, mining gave 36% of the ore, namely 1,032,549 tons with an average grade of 2.02% copper. This represents a decrease of 3.5% from the amount mined during the preceding year.

Drifting done in the C zone consisted in the extension of the main inclined roadway under the 1,800-foot level and in preparation work of stopes between the 1,700- and 1,800-foot levels, and supplied the remainder of the ore, that is 3%.

In the Copper Mountain deposit, the amount of rock mined was 883,459 tons, broken from benches at the 2,300-, 2,320- and 2,340-foot elevations above sealevel.

Ore reserves in this deposit were estimated anew from 19,000,000 tons grading 0.82% copper to 31,038,000 tons grading 0.71% copper.

The manager was H.S. Bérubé.

THE HILTON MINES, Bristol Township, Pontiac

Production: iron concentrate

During the year reviewed here, the concentrator of The Hilton Mines produced 859,930 long tons of concentrates having an average content of 65.92% iron.

The concentrate production necessitated the drawing of 9,100,967 long tons of ore and sterile rock from the open-pit workings.

The ore was extracted from the eight benches that gave a depth of 260 feet in 1963.

The mine employed 450 men in 1963.

During 1964, the concentrating plant produced 895,599 long tons of pelletized concentrates averaging 66.69% iron.

The production of concentrates necessitated the mining of 8,926,846 long tons of ore and steriles. From this total 3,426,352 long tons went to the primary crusher and 1,963,049 was shipped to the concentrating plant.

Mining was done alternately on the nine 35-foot-high benches of the open-pit.

C.D. Keith was mine superintendent.

IRON ORE COMPANY OF CANADA, New Quebec, Duplessis

Producer: iron ore

During the year 1963, mining by open-pit methods by the Iron Ore Company of Canada at Schefferville yielded 6,070,902 long tons of iron ore. The amount of ore coming from deposits in the Province of Quebec was 2,982,628 long tons, or 49% of the total tonnage exploited.

The following figures summarize the work done at the various open-pits during the year under review.

Open-pits	Material Stripped Cubic Yards	Ore Mined Long Tons
Quebec		
Gagnon A	846,100	1,236,352
Ferriman	2,175,300	1,453,443
Burnt Creek	378,600	292,833
French	291,200	---
Total	3,691,200	2,982,628

The shipping season during 1963 lasted six months, that is from April 14 to November 28.

During 1963, a total of 13,389 feet of diamond drilling was completed on the non-exploitable stopes near Schefferville. The deposits examined were: Flemming No. 5 - 9,680 feet; Flemming No. 6 - 2,151 feet and Flemming No. 8 - 1,551 feet.

Research was carried out during the year reviewed in the laboratories of the company at Schefferville in order to discover a process for concentrating the ore in a manner at once profitable and satisfactory with respect to market demands.

During 1964 a total of 7,795,720 long tons of ore was mined from the company's open-pits at Schefferville, of which 4,100,485 tons came from the Quebec side of the frontier.

The following table summarizes activities in the different Schefferville open-pits during 1964.

Open-pits	Stripping Cubic Yards	Ore Long Tons
Quebec		
Ferriman	2,151,500	2,072,977
French	1,100,600	1,593,997
Ruth Lake	329,200	433,511
Total Quebec	3,581,300	4,100,485

The proportion of ore mined from open-pits situated in the Province of Quebec was therefore 52.6%.

The Gagnon A open-pit was not mined during 1964.

During the year, 13,507 feet of diamond drilling was done on known but unmined deposits in the vicinity of Schefferville. Deposits under study were Flemming No. 6: 3,156 feet of drillings, and Flemming No. 8: 10,351 feet.

V. Grégoire was the manager of the mines.

JOUTEL COPPER MINES LIMITED, Joutel Township, Abitibi-East

Development: copper

The operation of sinking a 3-compartment vertical shaft at the property of Joutel Copper Mines Limited was temporarily suspended at a depth of about 790 feet toward mid-October 1962. Work was resumed near the end of January 1963.

The shaft sinking was terminated at 1,075 feet during the month of May 1963, and exploratory drifts were advanced on two levels established at the respective depths of 575 and 1,025 feet.

It is reported that, when the work was again temporarily suspended about the middle of November, approximately 2,000 feet of drifts had been excavated and nearly 20,000 feet of diamond drill holes had been bored.

According to reports, the ore reserves indicated through diamond drilling amount to 1,100,000 tons yielding on the average 2.3% copper. Development and exploration work,which had been temporarily suspended during November, 1963, was resumed in March, 1964. This work was concentrated at the 1,025-foot level where a cross-cut was extended southward over a distance of about 577 feet, and drifts were driven eastward and westward at the ends of the cross-cut, over a total distance of 849 feet. Two raises totalling 39 feet were driven to enable the establishment of two stations for deep diamond drilling.

Diamond drilling for exploration purposes amounted to 1,989 feet from the surface and to 16,496 feet from the 1,025-foot level. No work was done at the 575-foot level during 1964.

Ore reserves indicated by diamond drilling amounted to 1,408,000 tons averaging 2.5% copper and 400,000 tons averaging 9% zinc and 0.2% copper.

Development work was done by R.F. Fry and Associates Limited. H.A. Weiss was resident engineer for Joutel Copper Mines, Limited.

KIENA GOLD MINES LIMITED, Dubuisson Township, Abitibi-East

Development: gold

Kiena Gold Mines Limited completed during 1963 the buildings necessary to its mining operations, namely, offices, cloak and dry room, headframe and shelter, hoist room, and boiler room, as well as other smaller buildings.

Testing of the property by diamond drilling from surface was continued on the ice.

On December 10, 1963, the firm of E. Ross and Associates started the digging proper of a 3-compartment shaft. At the close of the year, the shaft had attained a depth of 219 feet. This shaft is located to the east of Parker island, in Demontigny lake. It was completed in July, 1964, to a depth of 1,324 feet. Stations were established at the 240-, 410-, 560-, 700-, 800-, 900-, 1,000-, 1,100-, and 1,250-foot levels. A sump was dug at the 1,250-foot level with a sedimentation cone dug from a chute that was driven up to the 1,100-foot level.

Drifts join and follow the mineralized zone (S-50) on three levels, namely the 560-, 900-, and 1,100-foot levels. Total lengths of drifts driven at these three levels are 2,457, 1,421, and 2,601 feet respectively.

Underground diamond drilling totalled 19,509 feet representing about a fifth of the drilling program established before operation norms were established; they were done mainly on the three levels mentioned above. At year end this drilling was the only work done and necessitated the use of five drills.

On surface, drilling of two holes from the ice was completed and a controlling hole was drilled north of the Parker shaft in order to establish the site of another possible shaft.

The number of men employed at this mine represented an average of 50; most of them were under the direction of E. Ross and Associates.

The manager of the company was D.E. Howard.

LAKE DUFAULT MINES LIMITED, Dufresnoy Township, Rouyn-Noranda

Development: copper, zinc, gold, silver

The sinking of a 3-compartment vertical shaft, commenced at the beginning of January 1963, was stopped at a depth of 1,996 feet about the first of December. Seven stations were established at depths of 400, 790, 1,160, 1,290, 1,420, 1,620, and 1,775 feet. A primary jaw-crusher will be installed on the 1,775-foot level, and the broken-ore chute will be located at a depth of 1,875 feet.

The shaft-sinking operation was temporarily suspended at a depth of 1,350 feet, about the beginning of July, in order to set up exploratory drifts on the 1,160- and 1,290-foot elevations. Sinking of the shaft was resumed toward the end of September.

Lateral development and exploration were conducted at the property and resulted in the digging of 2,400 linear feet of cross-cuts and drifts. Out of this total, 2,102 feet of drifts was pierced on the 1,160- and 1,290-foot levels. Raises intended for emergency exits and for ventilation purposes were advanced from the 790-foot elevation to the surface. There was also some work of this type done at other elevations. An ore chute and waste pass system was likewise initiated. By the close of the year reviewed here, a total of 1,146 feet of raises had been completed.

Diamond drilling with a view to exploration and for the purpose of delimiting the ore deposit amounted to 33,258 feet of holes bored from below surface, mainly from the 1,160- and 1,290-foot levels. Diamond drilling from surface was continued on the Norbec section of the property. A total of 60,128 feet of holes was completed from this section, which contains the ore deposit.

The company commenced construction of a mill which will have a daily capacity of treating 1,200 tons of ore. At the close of the year, foundations for the crushing and screening installation, as well as those for the mill, were completed. The year end also saw the completion of the following buildings: a fitting and repair shop, a cloak and dry room, a combined office and warehouse, the laboratory, an unheated storehouse and the building housing the furnaces.

It is reported that the ore reserves indicated through diamond drilling in the "A" deposit amounted to 1,360,000 tons. This tonnage should have an average grade of 5% copper, 10% zinc, 3.2 ounces of silver and 0.04 ounce of gold a ton.

The construction of the concentrator which had been started in 1963 was completed during the summer of 1964. The plant was opened around August 14 and produced intermittently up to October 1 during the period of adjustment of the machines and of the circuit.

During the last three months of the year, the concentrator was in continuous production and treated daily 1,219 tons of ore averaging 5.0% copper, 7.6% zinc, 0.035 ounce of gold and 2.37 ounces of silver a ton. Ore treated was mined during development and preparation work in stopes located in "A" and "B-1" deposits.

Lateral development work was concentrated on the 1,158-, 1,287- and 1,415-foot levels. Drifts, cross-cuts, including haulage drifts and drag points driven during the year, amounted to a total of 8,794 feet. Raises driven for the preparation of stopes and of ore and sterile chutes totalled 5,485 feet. Lateral work for other purposes such as the cutting of stations and of the crusher room, the digging of a repair shop and of sumps amounted to 124 feet.

Diamond drilling for exploration and for delimiting ore deposits totalled 21,043 feet from underground workings on levels between the 1,158- and 1,615-foot depths. On surface, diamond drilling was continued on the Norbec section of the property where deposits are located, and totalled 49,949 feet.

Ore reserves, as at December 31, 1964, amounted to 2,189,500 tons averaging 3.9% copper, 7.0% zinc, 2.0 ounces of silver and 0.03 ounce of gold a ton.

The number of employees increased gradually during the year and attained 104 towards the end of December.

The manager of this mine was J.R. Smith.

LAMAQUE MINING COMPANY LIMITED, Bourlamaque Township, Abitibi-East

Producer: gold, silver

The amount of ore treated at the mine of Lamaque Mining Company Limited, during the year 1963, was 767,590 tons containing 0.169 ounce of gold a ton. The daily rate of milling was 2,103 tons. The production at this mine during the preceding year was derived from the treatment of 777,190 tons of ore at the daily rate of 2,130 tons grading 0.177 ounce of gold.

The ore was drawn from stopes between the 575- and 3,600-foot levels at the No. 1 mine, and between 125- and 700-foot levels at the No. 3 mine. This last-mentioned mine supplied a little more than 8% of the total tonnage extracted.

At the No. 1 mine, mining by open-pit methods of the "Main A", "J" and "E" zone supplied about 30% of the ore. The remainder of the ore came mostly from the veins and zone Nos. 18, 19, 32, 33, 35, 44, 52, 56, F, K, L, H, N, "dike B", "Lower C" and "Lower E". The central and east parts of the "Lower C" zone, between the 2,400- and 2,900-foot elevations, were the site of preparatory mining activity for exploiting the ore through long blast holes.

Most of the lateral development was effected in vein 13S, at the 950-foot level, in vein 19, at the 1,300- and 1,400-foot elevations, in vein 27N, at the border of the "Lower C" zone, at the 2,500- and 2,600-foot levels, in vein 41, at the 3,100- and 3,200-foot levels, and also in veins 44, 46, 46N at the 3,400- and 3,600-foot levels, in the northeast part of the mine. Furthermore, exploration work was continued in the "Northwest" zone by advancing a drift from the 1,475-foot level of the Sigma mine.

Besides the usual drilling to outline known veins and zones, exploratory drilling totalling more than 10,000 feet was undertaken at the 700-, 1,500-, 2,800-, 3,000- and 3,400-foot levels.

At the No. 3 mine, the main "East" drift of the 450-foot level was pushed for a distance of 875 feet in the direction of the No. 4 lens. In this same lens, at the 700-foot level, stope preparation was commenced in veins 6, 7, 8 and 9, and an exploratory raise was excavated. About 9,700 feet of diamond drilling was completed starting from this elevation in the No. 4 lens.

Ore reserves as of the close of the year under review were estimated at 2,354,316 tons. This ore graded 0.184 ounce of gold a ton.

The mine had 560 persons in its employ.

During 1964 the quantity of ore treated at the plant was 768,280 tons containing 0.167 ounce of gold a ton, a daily average of 2,099 tons. Daily tonnage and grade were practically the same as for the preceding year.

About 9% of the ore was mined from stopes in the No. 3 mine; in veins 7 and 7(N) of No. 4 lens; and at the 450- and 700-foot levels. The remainder came from No. 1 mine, 95% of which was mined from works located between the 1,300- and 3,600-foot levels. One third of the total production came from stopes mined by the open-stope method in "Main A", "Upper E", "J", and "29C" zones.

In the last-mentioned zone, about 80% of long hole drillings were completed in preparation for an extensive blast. To date tonnage from this zone came from the cut-and-fill.

At the No. 1 mine, westerly drifts were driven at the 1,300- and 1,400-foot levels in the area of No. 19 vein, the extension of which had been traced by diamond drilling. The exploration in depth of the extension of the "Q" vein under the 1,300-foot level was also started. At the 1,500-foot level, access to the extension in depth of vein 13 (s) has been made possible with a cross-cut driven southward from vein No. 39.

The area of the west lens has also been explored with diamond drilling and the presence of a new vein between the 1,200- and 1,500-foot levels has been established. A drift was driven in this direction to follow the shear zone of vein No. 39. During the year 3,843 feet of diamond drilling was done from surface.

At mine No. 3 development work was done towards the area of lens No. 4. A drift, about 3,000 feet long, was driven at the 450-foot level to join the ventilation raise that had been driven from the 700-foot level. This drift was used for the exploration of new structures in No. 4 lens.

The driving of a new ore chute at mine No. 1 was started between the 2,100- and 1,800-foot levels to replace the present one that was deteriorating.

Estimates of ore reserves are practically the same as those of the preceding year. As at October 1, 1964, they totalled 2,346,464 tons assaying 0.183 ounce of gold a ton.

The mine employed about 566 men, and the manager was A.W. Foley.

LORRAINE MINING COMPANY LIMITED, Gaboury Township, Témiscamingue

Development: nickel, copper

With the beginning of the year 1963, Lorraine Mining Company Limited decided to undertake underground development work in the nickeliferous zone that had been previously indicated by diamond drilling. To this end, a practicable road was built for a distance of three miles so as to connect the property with the Belleterre highway.

A mining installation was built on the surface and a 3-compartment vertical shaft was commenced at the beginning of October. At the end of December, the shaft had attained a depth of 545 feet, and three stations had been established at the respective depths of 203, 357 and 511 feet. This shaft is to be sunk to a depth of 1,000 feet.

Ore reserves indicated by diamond drilling were reported to be 550,000 tons of ore yielding an average of 2.1% nickel and copper combined.

Sinking of the vertical shaft was completed in early June, 1964, to the depth of 1,078 feet. Stations were established at the 203-, 357-, 511-, 665-, 819-, and 973-foot levels. A primary jaw crusher was installed at the 875-foot level and development and preparation work on stopes were started on the first four levels of the mine. These works included the driving of 4,332 feet of cross-cuts and drifts and of 1,353 feet of raises. A certain number of raises will serve as ore chutes between the loading pockets located at the 945-foot and 357-foot levels.

On surface, the construction of the permanent mining installations and plant, with a daily capacity of about 400 tons of ore, was started about December 9, 1964. As at December 31, 1964, the concentrator had treated 6,353 tons of ore averaging 1.37% copper and 0.725% nickel. Ore treated came from development and preparation work on stopes.

Underground diamond drilling for exploration purposes attained 9,711 feet. No diamond drilling was done from surface in 1964.

There was no change in ore reserves,which amounted to 550,000 tons averaging 2.1% nickel and copper.

During December 1964, the mine employed 90 persons and the manager for 1963 and 1964 was George B. Darling.

LES MINES ROY AND ROSS INC. Nicolas Rioux Seigniory, Rimouski

Exploration: barite, lead

Les Mines Roy and Ross Inc. own a barite and lead deposit in Nicolas Rioux seigniory.

Development work was carried out from surface and consisted in the removal of the overburden covering the ore veins.

A portable crushing and screening installation was put in operation during the month of October 1963. The waste rock that covers the ore will be extracted and prepared by crushing for use in the making of concrete and in construction. The ore will be drawn and stock-piled as a reserve. The extracted rock is sandstone and conglomerate.

Philippe Roy was the manager.

MALARTIC GOLD FIELDS LIMITED, Fournière Township, Abitibi-East

Producer: gold, silver

In 1963, the mill of Malartic Gold Fields Limited treated 146,800 tons of ore derived from the mine itself. This ore assayed 0.1461 ounce of gold a ton. The amount mined in the preceding year was 161,210 tons grading 0.153 ounce of gold a ton. If the amount of ore treated for other companies were taken into account, this plant may be said to have processed 799,083 tons of ore for a daily rate of 2,162 tons averaging 0.1321 ounce of gold a ton, as compared with 2,268 tons a day at 0.157 ounce of gold a ton during the preceding year.

The ore was drawn from stopes distributed between the 1,350- and 2,400-foot levels in the "A", "C", "F", "Q", "R" and "S" zones. Zone "A" supplied more than 60% of the ore treated. Much of the ore reserves is contained in this zone, between the depths of 1,550 and 1,800 feet.

Development work consisted in the driving of 134 feet of drifts in zone "Q", on the 1,650-foot level, as well as in the cutting of raises in the "A", "Q" and "R" zones.

Diamond drilling from below ground amounted to 5,814 feet bored mainly in the vicinity of zone "A". One hole drilled from surface to a depth of 825 feet was put down for the purpose of exploring the extension of zone "F".

As of December 31, 1963, ore reserves were estimated at 85,500 tons containing 0.14 ounce of gold a ton.

During 1964, the plant treated 122,771 tons of ore from the mine containing 0.1156 ounce of gold a ton compared to 146,800 tons assaying 0.1461 ounce of gold a ton for the preceding year. Including ore treated for other mining companies, this plant treated a total of 773,760 tons of ore containing an average of 0.127 ounce of gold a ton, for a daily production of 2,120 tons as compared to 2,189 tons for the preceding year.

Most of this ore was mined from the "A" zone between the 1,550- and 1,800-foot depths; the remainder came from "C", "F", "Q", "R" and "S" zones, between the 1,350- and 2,100-foot levels.

Recovery work of the still useable material was continued together with mining operations. At year end, only a few thousand tons remained in the mine.

The mine employed an average of 210 persons in 1963, and of 175 in 1964, under the management of R.W. Dempsey.

MALARTIC HYGRADE GOLD MINES LIMITED, Malartic Township, Abitibi-East

Producer: gold, silver

Malartic Hygrade Gold Mines Limited stopped mining ore from its underground workings on April 10, 1963. The amount of ore that had been shipped to the mine of Malartic Gold Fields Limited from the beginning of January to that date totalled 6,293 tons yielding an average tenor of 0.362 ounce of gold and 0.01 ounce of silver a ton.

This ore was taken from vein No. 1, on the 250-foot level and from vein No. 2 on the same level and also on the one at the 400-foot elevation.

Drifting on the 250-foot level only was in progress up to July 15 of the year reviewed.

One of these drifts extended 600 feet to the north of the shaft where it joined vein No. 3. There was virtually no gold in the rock mined at this place.

Another drift was advanced 250 feet to the west of vein No. 2 in order to reach a vein outlined through drilling. This vein was also sterile.

Finally, a drift was also dug in the direction of vein No. 7, which had been previously disclosed through drilling from surface. The drift was stopped at approximately 1,335 feet from this vein, that is about 450 feet southwest of vein No. 2.

A small footage of drilling was carried out from the surface, a part of which disclosed vein No. 7.

After underground work had been discontinued, the construction of a crushing mill and of a processing plant was commenced. At the close of the year under review, these two buildings had been completed, as well as the conveyors connecting them. No machinery had been installed at year end, except the heating system.

The number of employees varied greatly during the year 1963 and,at the end of December, 24 persons were on the payroll.

O. Hamel was the general superintendent.

Mining,which had been interrupted underground in April 1963, was not resumed and, in July 1964, the recovery of equipment was completed. The mine workings are being flooded.

One watchman remains on the property.

MANITOU-BARVUE MINES LIMITED, Bourlamaque Township, Abitibi-East

Producer: gold, silver, copper, zinc, lead

During the course of the year 1963, the mill of Manitou-Barvue Mines Limited processed 467,365 tons of ore. Of this total, 293,000 tons consisted of copper ore and 174,365 tons was classed as zinc ore, as compared with 291,400 tons of copper ore and 169,140 tons of zinc ore for the preceding year. The copper ore assayed 0.93% copper and 0.016 ounce of gold a ton, whereas the zinc ore contained 5.63% zinc, 0.73% lead, 0.032 ounce of gold and 4.52 ounces of silver a ton.

In the copper zone, the ore was derived from the mining of stopes distributed between the 660- and 1,570-foot levels. This was also the scene of development work and of stoping preparations.

Exploration and development drifting amounted to a total of 1,182 linear feet, whereas drifts for the preparation of stopes were cut along 5,027 feet. These operations were carried out on almost all the levels situated between the depths of 660 and 2,180 feet, but mainly between the 1,720- and 2,180- foot levels. In this zone, moreover, there was a total of 2,763 linear feet cut for ventilation raises, ore chutes and stoping preparations.

In the zinc zone, ore was drawn from 14 stopes located between the 2,490- and 3,990-foot level. Lateral development in this zone comprised 4,631 feet of drifts for exploration and development purposes and also 1,552 feet of drifting for stope preparation. This work was effected between the 2,490- and 3,990-foot elevations.

Moreover, in this zone, 829 feet of raises was cut for stope preparations and ore chutes during the year 1963.

There was no drilling carried out from surface during the year reviewed. Diamond drilling from below ground represented 27,684 feet distributed across the mine, but especially on the 2,030- and 2,180-foot levels in the copper zone and on the 3,390- and 3,990-foot levels of the zinc zone.

A second permanent storehouse for explosives was built on the surface, as was likewise a building for housing an auxiliary motor-power installation.

At the close of the year reviewed, reserves comprised 562,584 tons of copper ore containing 1.12% copper, 0.19 ounce of silver and 0.018 ounce of gold a ton, as well as 266,641 tons of zinc ore assaying 5.42% zinc, 0.72% lead, 4.83 ounces of silver and 0.026 ounce of gold a ton.

S.A.J. Hopper was the manager of this mine, which employed 355 persons.

During 1964 the plant treated 387,905 tons of ore. Of this total, 244,980 tons was copper ore and 142,925 tons was zinc ore, compared to 293,000 tons of copper ore and to 174,365 tons of zinc ore for the preceding year. The copper ore graded 0.80% copper and 0.044 and 0.14 ounce of gold and silver a ton respectively, whereas the zinc ore contained 5.05% zinc, 0.57% lead, 0.035 ounce of gold and 3.68 ounces of silver a ton. The mine was inactive from February 20 to April 21, owing to a general strike.

In the copper zone ore came from the mining of stopes distributed between the 660- and 2,180-foot levels, as well as from development and stope preparation work between the 960- and 2,180-foot levels. The mining of a few stopes in low-grade ore was started.

Zinc ore was mined from stopes at levels located between the 2,940- and 3,999-foot depths, as well as from stopes being prepared at the 2,940-, 3,390-, 3,840- and 1,720-foot levels. At the last-mentioned level, stopes in the old section of the mine, where the zinc tenor is low but the silver grade is higher than average, were being prepared.

The driving of a drift in a westerly direction was completed at the 3,390-foot level and exploration by diamond drilling did not reveal the existence of new zinc ore deposits. At the 3,990-foot level, the driving of a drift in a westerly direction was also started and is to extend to the limit of the property. In this locality also, exploration work is being done with the aim of discovering a new zinc ore deposit.

At the 3,840-foot level a drift was driven in an easterly direction and diamond drilling was carried out with a view of exploring the possible extension in depth of the copper zone mineralization.

Other diamond drilling was done, mainly between the 810- and 1,870-foot levels. At the latter, drilling explored the old section of the zinc ore stopes. At the 810- and 1,410-foot levels, drillings were aimed at establishing the presence of other mineralized lenses.

At year end, ore reserves included 477,556 tons of copper ore containing 1.18% copper, 0.20 ounce of silver and 0.01 ounce of gold a ton, as well as 584,140 tons of zinc ore containing 3.59% zinc, 2.00% silver and 0.03 ounce of gold a ton.

A.K. Campbell was the manager of the mine where 350 persons were employed in 1964.

MARBAN GOLD MINES LIMITED, Dubuisson Township, Abitibi-East

Producer: gold, silver

During the course of the year 1963, Marban Gold Mines Limited shipped 142,269 tons of ore grading 0.1764 ounce of gold a ton to the mill of Malartic Gold Fields Limited at the average rate of 390 tons a day. During the preceding year, the ore shipped represented 91,956 tons containing 0.152 ounce of gold a ton.

All the ore was drawn from between the 500- and 800-foot elevations. Most of the ore was supplied from stopes of the "C", "D" and "G" zones; the remainder came from stopes of the "F", "J", "K" and "L" zones.

Development work consisted in 3,544 feet of drifts and 1,767 feet of raises. Raises were pierced in several zones between the 500- and 800-foot elevations.

Drifts were advanced in zone "C" on the 500-, 650- and 800-foot levels, in zone "D" on the 800-foot level and in zones "G", "J", "M" and "P", on the 650-foot elevation. Sub-drifts were completed between the 650- and 800-foot levels in zones "J", "K" and "L".

The new zones, "M" and "P", are located at the extreme east of the property. On the 650-foot level nearly 250 feet of drifts was driven in the "M" zone and about 500 feet, in the "P" zone.

Underground diamond drilling amounted to 32,765 linear feet. This drilling consisted in the outlining of stopes, the exploration of zones "M" and "P", starting from drifts of the 650-foot elevations, and, lastly, the exploration at depth starting from the 800-foot level. Testing from surface comprised ten holes in the east part of the property and two holes to the west of the shaft, in zone "C".

At the close of the year reviewed here, ore reserves were estimated at 293,000 tons yielding 0.165 ounce of gold a ton.

The mine employed about fifty people under the management of R.W. Dempsey.

During 1964 this mine shipped to the treatment plant of Malartic Gold Fields a total of 157,872 tons of ore grading 0.1563 ounce of gold a ton, a daily average of about 433 tons compared to 390 tons assaying 0.1764 ounce of gold a ton for the preceding year.

Ore was mined from stopes in C, D, F, G, K, L, M, R, and S zones, between the 500- and 800-foot levels.

During the year drifts were driven in C zone at the 500-foot level, in G, J, M, P, and R zones at the 650-foot level and in D, L, and M zones at the 800-foot level. This work was done mainly in the east part of the mine and totalled 3,517 feet.

At the 650-foot level, the drift in P zone was extended eastward up to about 50 feet into the property of Little Long Lac Gold Mines Ltd. On this latter property, a sub-drift at a depth of 575 feet, as well as an exploration raise at the end of the sub-drift, was driven. Work was discontinued after the mining of 898 tons of ore.

At the Marban mine, the drift in C zone at the 500-foot level was extended up to about 100 feet from the eastern limit of the property. At the 800-foot level, the drift of M zone was driven eastward over a length of a few hundred feet. Sub-drifts were driven in G and S zones. Numerous chutes were dug in the east part between the 800- and 500-foot levels over a total length of 1,648 feet.

On surface four diamond drill holes totalling 4,429 feet were made. Underground, drilling included 17 exploration holes in depth from the 800-foot level as well as numerous other holes at the 500- and 650-foot levels. These holes totalled 38,036 feet.

At year end, ore reserves amounted to 345,000 tons assaying 0.16 ounce of gold a ton.

In 1964 the mine employed an average of 53 persons under the management of M.D. Kennedy.

MARBRIDGE MINES LIMITED, LaMotte Township, Abitibi-East

Producer: nickel

During the year 1963, Marbridge Mines Limited shipped, to the processing plant of Canadian Malartic Gold Mines Limited, a total of 141,264 tons of ore grading 2.30% nickel at the daily average of 387 tons. For the preceding year shipments amounted to 99,311 tons of ore containing 2.18% nickel.

The ore was derived from the mining of nine stopes between the 150- and 900-foot levels, as well as from development work.

During the summer, a 3-compartment vertical shaft was sunk from the 308-foot level to a depth of 1,255 feet. Two new levels were established at depths of 1,050 amd 1,200 feet. About 950 feet of drifts and cross-cuts was excavated on each of these new levels in order to develop the vein. Lateral development work was also effected on the 750- and 900-foot levels. A total excavation of 2,616 feet of drifts and cross-cuts was carried out during the year reviewed. Raises, for the purpose of stope preparation and ventilation, were pushed for a distance of 831 feet.

From below surface, 36 diamond drill holes were put down for a total of 7,505 feet. Most of this drilling was carried out starting from the 900-foot level in order to explore the vein at depth. Ten holes were drilled from surface in the vicinity of the deposit itself.

At the close of the year reviewed here, ore reserves were estimated at 240,730 tons assaying 2.06% nickel.

During 1964 this mine sent for treatment at the Canadian Malartic Gold Mines plant a total of 146,337 tons of ore assaying 2.06% nickel, a daily average of 402 tons. Ore dumped at this plant at the end of 1964 totalled 5,388 tons.

Ore was mined from eleven stopes distributed between the 150- and 1,200-foot levels as well as from development work. Mining was done in stopes of the 900-, 1050- and 1,200-foot levels. At the 150-, 300- and 450-foot levels, recuperation of crown pillars was started.

During the year 1,576 feet of drifting was done, mainly at the 1,050- and 1,200-foot levels.

The shaft was deepened an additional 144 feet and is now 1,410 feet deep. A new station was established at the 1,350-foot level and, at the end of the year, 6 feet of cross-cutting had been made.

Underground diamond drilling was done mainly at the 1,200-foot level with a view of exploring ore in depth. A few holes were drilled at this level, and at the 900- and 1,050-foot levels, aimed at exploring the vicinity of stopes.

On surface 22,370 feet of diamond drilling was done in a southeast direction along the extension of the deposit. About 3,000 feet from the present shaft another deposit initially thought to contain 100,000 tons averaging 2.35% nickel, was found.

This is now mine No. 2 where the sinking of the crown of the three-compartment shaft was done to a depth of 43 feet. The headframe was erected and the foundation of the hoist building was completed.

At the end of 1964 ore reserves of the No. 1 mine were estimated at 110,500 tons assaying 1.90% nickel.

The firm of R.F. Fry and Associates, operators of this mine, employed 55 men in 1963 and 65 men in 1964 under the direction of G. Whidden, superintendent. R.C. Staveley, manager, supervised the work for Marbridge Mines and employed two men.

MATTAGAMI LAKE MINES LIMITED, Galinée Township, Abitibi-East

Producer: zinc, copper, gold, silver

The construction of the buildings that had been commenced in 1962 was finished during 1963. The ore processing plant was completed and opened about the end of September and the daily tonnage of ore treated was gradually increased. During the month of December, the mill operated at full capacity, that is at the rate of 3,000 tons a day.

As of December 31, 1963, the mill had processed a total of 166,725 tons of ore, and produced 31,444 tons of zinc concentrates and

4,622 tons of copper concentrates. Almost all the zinc concentrates produced was shipped to the zinc refinery of Valleyfield, whereas the copper concentrates were shipped to the Noranda smelter. The ore was derived from stopes, as well as from reserves piled at the surface during stope preparation, before the mine was put into operation.

A total of 245,236 tons of ore was raised to surface during the course of 1963. This ore had an average grade of 14.5% zinc and 0.72% copper. Most of the ore came from development and stope preparation operations. No holes were made from surface during the year reviewed. However, exploratory diamond drilling from below surface amounted to 2,764 linear feet. Moreover, drilling for the purpose of outlining stopes comprised 10,874 feet of holes.

Development work at Mattagami Lake Mines Limited consisted in the digging of 5,164 feet of drifts and 111 feet of raises. Stope preparation necessitated the excavation of 10,976 feet of drifts of an intermediate nature and 5,982 feet of raises. Most of these operations were carried out between the 350- and 750-foot levels.

The company reported no change in the ore reserve situation, which, at the end of 1962, was set at 19,514,500 tons grading 12% zinc, 0.73% copper, 0.018 ounce of gold and 1.31 ounces of silver a ton, in the main deposit. The second deposit, situated a few hundred feet east from the first, contained 2 million tons having an average tenor of 12.86% zinc, 0.86% copper, 0.013 ounce of gold and 0.99 ounce of silver a ton.

1964 was the first complete year of operation for the concentrator which produced daily 3,503 tons of ore averaging 12.8% zinc, 0.71% copper, 0.014 ounce of gold and 1.15 ounces of silver a ton. The quantity of ore treated daily was gradually increased during the year from about 3,000 tons to 3,800 tons.

Ore treated came from stopes in deposit No. 1, between the 550- and 750-foot levels, as well as from development and preparation work executed in this same deposit.

On the 350-, 550- and 750-foot levels, drifts were driven towards deposit No. 2, located about 800 feet southeast of deposit No. 1, with the aim of exploring this deposit underground. Later on, these drifts will be used as a starting point for the development of the deposit and for the preparation of stopes. Preparatory work for exploration of lower extension of deposit No. 1 was also started at the 960-foot level. A total of 6,905 feet of drifts and cross-cuts was driven during the year.

The preparation of stopes necessitated the driving of 13,542 feet of sub-drifts, 2,294 feet of haulage drifts and the digging of 3,977 feet of raises, as well as 3,836 feet of draw points.

Underground exploration diamond drilling amounted to 55,058 feet. An important portion of these was made in No. 2 deposit. Diamond drilling from surface totalled 4,229 feet.

On December 31, 1964, ore reserves attained 18,860,820 tons assaying 10.8% zinc, 0.70% copper, 0.014 ounce of gold and 1.15 ounces of silver a ton in deposit No. 1. Underground exploration of No. 2 deposit was not completed but it is estimated that there are about 1,200,000 tons of ore. In addition, numerous small lenses could contain about 2.5 million tons of low-grade ore, a portion of which could ultimately be mined.

The manager of the mine was M.W. Airth,who had 367 men under his direction in 1963 and 415 in 1964.

MERRILL ISLAND MINING CORPORATION LIMITED, Obalski Township, Abitibi-East

Production: copper, gold, silver

Merrill Island Mining Corporation produced, during the course of the year 1963, concentrates containing 6,974,220 pounds of copper, 2,825 ounces of gold and 67,301 ounces of silver. These metals were recovered from 143,086 tons of ore grading 2.51% copper, 0.024 ounce of gold and 0.61 ounce of silver a ton.

The concentrator treated a daily average of 395 tons of ore and recovered 95.3% of the copper contained therein. The concentrated product contained 27.3% copper.

Preparatory work and exploration operations were carried out mainly at the lower levels of the mine. During the year reviewed, an agreement was concluded,with Chib-Kayrand Copper Mines Limited and with United Obalski Mines Limited,which provided for the study and exploitation of deposits situated in the neighboring properties belonging to these companies;

Ore reserves as published in the company's annual report to its shareholders, under date of June 30, 1963, were 162,600 tons of ore assaying 2.34% copper, 0.02 ounce of gold and 0.46 ounce of silver a ton.

The mine was employing 130 men at the end of the year reviewed here.

1) Mining

The millfeed was drawn from zones "A" and "B", the active stopes of which are situated between the 150-foot level and surface, and in zone "E", at the lower levels of the mine.

2) Exploration

Exploration work effected in 1963 comprised 2,553 feet of drifts, 2,823 feet of raises, 1,592 feet of drilling from surface and 22,930 feet from below ground.

During 1964 the company produced concentrates containing 5,800,418 pounds of copper, 3,093 ounces of gold and 65,644 ounces of silver from 133,026 tons of ore containing 2.38% copper, 0.029 ounce of gold and 0.60 ounce of silver a ton.

An average of 589 tons of ore was concentrated each working day and 96.3% copper was recovered. The concentrate contained 27.5% copper.

As was the case during the preceding year, development and exploration work was concentrated at the lower levels of the mine. A drift was driven towards a deposit belonging to Chib-Kayrand Mines Ltd. In addition the treatment plant concentrated on a custom basis ore from United Obalski Mines Ltd.

Ore reserves, according to the annual report of the company dated June 30, 1964, totalled 98,145 tons containing 2.46% copper, 0.025 ounce gold and 0.51 ounce silver a ton.

The mine employed about 130 men at the end of 1964.

Exploration work during 1964 included 4,730 feet of drifts; 2,986 feet of raises and 26,579 feet of drilling from underground workings.

The manager of the mine was E.W. Watt.

MERRILL-OBALSKI MINES LIMITED, Obalski and McKenzie Townships, Abitibi-East

Development: copper, gold

During the course of the year 1963, United Obalski Mining Corporation concluded an agreement with Merrill Island Mining Corporation Limited by which the latter would acquire the 40 claims held by Chibougamau Pioneer Mining Corporation and previously bought as a block by United Obalski.

The work of restoring the shaft and of erecting buildings on surface was commenced only at the close of the year under study. This work was under the direction of the firm of R.F. Fry and Associates.

Diamond drilling during 1963 amounted to 17,442 feet.

The manager of this mine was E.W. Watt.

MOLYBDENITE CORPORATION OF CANADA LIMITED, Lacorne Township, Abitibi-East

Producer: molybdenite, molybdic oxide, bismuth

In 1963, the mill of Molybdenite Corporation of Canada Limited treated 275,876 tons of ore, that is the equivalent of about 893 tons a day calculated on the basis of a 6-week operating schedule. This tonnage does not include the near-waste picked at the crushing plant, which represented about 11,700 tons. The average grade of the ore was 0.248% molybdenite and 0.033% bismuth. The destruction by fire at the beginning of the year of the building housing the boilers and compressors resulted in a lowering of production. For the preceding year, the tonnage treated was higher at 278,439 tons, whereas the tenor of molybdenite and of bismuth was also superior, being respectively 0.275% and 0.041%. Nearly all the molybdenite concentrates was converted to molybdic oxide.

The ore still comes from the same veins, namely the Nos. 29 and 62. It is now mined to the depth of 625 feet, where the ore of vein No. 29 is drawn, and at the bottom level of the mine, at a depth of 1,000 feet.

Development work was carried out along vein No. 29, mainly at the 250- and 1,000-foot levels, and in vein No. 3, at the 500-, 625- and 1,000-foot elevations.

Almost every level of the mine experienced some diamond drilling. The only inactive levels were those at 125 and 875 feet. Testing by drilling was continued at depth in the known veins starting from the 1,000-foot level.

Ore reserves were virtually the same as those of the preceding year. As of December 31, 1963, these reserves were approximately 291,400 tons grading 0.32% molybdenite.

During the year under review, a building was constructed to house the compressors and another one was erected for the boilers. A new boiler and a new compressor were installed in these constructions. In the processing plant the circuit permitting hydraulic back filling below surface was installed.

In 1964 the plant treated 273,833 tons of ore, a daily average of 886 tons based on a six-day week. This figure does not include the almost sterile rock that was sorted at the crushing plant, namely about 8,018 tons. The average grade of the ore was 0.246% molybdenite and 0.036% bismuth. During the preceding year the tonnage treated was higher, 275,876 tons, but tenors in molybdenite and bismuth were practically the same, that is to say 0.248% and 0.033% respectively. About 99% of the molybdenite concentrate was converted into molybdic oxide.

Ore came mainly from No. 29 vein at various levels between the 1,000- and 250-foot levels and from Nos. 01, 02, 28, and 83 veins at various levels between the 750- and 250-foot levels. Most stopes were worked by the shrinkage method, except two stopes that were worked by the cut-and-fill method at the 500- and 750-foot levels, and an open stope at the 375-foot level.

Drifts were driven at the 250-foot level in No. 01 vein, at the 375-foot level in No. 64 vein, at the 500-foot level in No. 27 vein, at the 750-, 875-, and 1,000-foot levels in No. 28 vein, and lastly in No. 29 vein at practically all levels of the mine.

Underground diamond drilling totalling 25,205 feet was distributed at all levels excepting the 125-foot one. At the 625- and 1,000-foot levels, the total exceeds 6,000 feet. Most of the drilling was done to delimit new stopes although, at the 250-foot level, two holes were also drilled, each exceeding 1,000 feet, with the aim of exploring, without success, ground north of the No. 29 vein.

During 1964, the bismuth refinery building was erected anew and an electrostatic precipitator was installed in the fritting plant. A building for fire prevention apparatus was also erected.

Ore reserves were maintained at virtually the same quantity as during the preceding year. On December 31, 1964, they were estimated at about 295,521 tons assaying 0.27% molybdenite.

C. Marcoux was the manager of the mine where the total number of employees was, on an average, 177 in 1963 and 168 in 1964.

MOLY HILL MINING CORPORATION, LIMITED, LaMotte Township, Abitibi-East

Development work: molybdenite, bismuth

This company was incorporated on the August 19, 1964. It acquired claims owned by Utufora Mines, Ltd., located in Lamotte and Preissac townships, as well as other contiguous claims. The Utufora deposit is located in the center of lot 5, range II.

No diamond drilling was done in 1964. However, digging of trenches was continued in the north and south parts of range II, along a line separating lots 4 and 5. About 1,000 feet southwest of the initial deposit, a small-sized mineralized pegmatitic granite zone was discovered. About 2,000 feet northwest of the same deposit another much more important mineralized zone was discovered in a chloritized schist zone.

A magnetometer survey covering lots 4 to 7 inclusive and part of lot 3, range II of LaMotte township, was carried out along east-west lines spaced at 100 feet.

The existing road was extended over a distance of half a mile to join the northwest zone.

Possible and probable ore reserves in the central deposit are estimated at about 200,000 tons containing 0.20 and 0.025% molybdenite and bismuth respectively.

G.-E. Huot is president and general manager of this enterprise.

NEW CALUMET MINES LIMITED, Grand-Calumet Township, Pontiac

Producer: zinc, lead, gold, silver

During the course of the fiscal year that ended on September 30, 1963, New Calumet Mines Limited processed 93,300 tons of ore having a tenor of 6.75% zinc, 1.83% lead, 0.018 ounce of gold a ton and 3.86 ounces of silver a ton. The quantity of ore treated each day was 306 tons. According to the annual report to the shareholders of the company, ore reserves were established at 406,521 tons. This figure includes 116,633 tons of proved ore reserves on the neighboring property of Grand Calumet Mines Limited.

About 52% of the ore came from the zone of shaft No. 4, 46% was drawn from the zone of shaft No. 3, and 2% was mined at shaft No. 1. Three stopes from the zone of shaft No. 4 were mined on the property of Grand Calumet Mines Limited.

A total of 2,474 feet of drifts and raises was excavated during the company's fiscal year, which ended on September 30, 1963. More than half of this work was undertaken to give access to the mineralized zone on the property of Grand Calumet Mines Limited. Moreover, 15,296 feet of diamond drilling was completed on the two properties.

The total number of men employed at this mine rose to 137. Out of this number 71 were working underground.

In 1964 the plant treated 95,606 tons of ore with an average tenor of 6.09% zinc, 1.61% lead, 0.016 ounce of gold and 3.55 ounces of silver a ton.

Most of this ore came from the No. 4 shaft zone where nine stopes were in operation. Recovery of pillars was done in six of them. Seven others were operated in the No. 3 internal shaft zone.

During September the company commenced the sinking of a vertical internal shaft and, at year end, this shaft was 134 feet deep. At a maximum depth of 897 feet, the shaft will allow the mining of a new ore zone situated on the old Grand Calumet Mines Limited property which was acquired by New Calumet in October, 1963.

Development and exploration work was done mainly in the zone neighboring the new shaft. It included 2,611 feet of drifts, 662 feet of chutes and a 342-foot-long inclined drift. Underground diamond drilling done during the year totalled 23,644 feet. A total of 5,330 feet was drilled from the surface.

The manager of the mine was C.J. Cunningham-Dunlop.

NEW HOSCO MINES LIMITED, Daniel Township, Abitibi-East

Producer: copper, zinc, gold, silver

At the end of December 1963, New Hosco Mines Limited had shipped to the mill of Orchan Mines Limited a total of 42,804 tons of ore grading 1.96% copper. The processing of this ore had commenced about October 25, 1963.

Most of the ore that was shipped to the mill of Orchan Mines Limited came from the reserves that were piled on the surface during the period prior to the opening of the mill, while preparatory work at the mine and stope preparations were being effected.

Three stopes, where the ore will be broken by the deep-blast-hole method, were prepared in the "A" deposit, and a system of ore raises was completed between the jaw-crusher, situated on the 930-foot level, and the 294-foot elevation.

At the end of December, the cumulative total of drifts and cross-cuts extended for development purposes or for stope preparation was 5,879 feet, and the raises advanced for the same object had a total length of 3,537 feet.

No exploratory diamond drilling was carried out from surface; however, drilling from below surface amounted to a total of 10,590 feet.

Reserves were reported to be at 2,178,000 tons grading 2.7% copper and at 958,000 tons assaying 7.9% zinc.

During 1964, daily shipping of ore from New Hosco to The Orchan Mines Limited concentrator attained 902 tons with an average tenor of 2.44% copper.

Ore came mainly from Nos. 1, 2 and 3 stopes in upper "A" deposit and from development work done in lower "A" deposit.

To allow the mining of pillars in upper "A" deposit during 1965, stripping of overburden overlying this deposit was begun and the construction of a levee along Allard river opposite the deposit was started.

Development and exploration work included 3,744 feet of drifting and the digging of 872 feet of chutes.

Underground diamond drilling in search of new deposits, or of the extension of known ones, totalled 4,800 feet. No diamond drilling for exploration purposes was done from surface.

At the end of December 1964, ore reserves amounted to 657,000 tons assaying 2.98% copper.

At the close of the year 1963, this mine employed about 45 persons and, in 1964, it employed an average of 39 persons. The property is managed by Noranda Mines Ltd. and work is done under the supervision of Orchan Mines Ltd. personnel.

NORANDA MINES LIMITED, Rouyn Township, Rouyn-Noranda

Producer: copper, gold, silver, pyrite

Production at the Horne mine in 1963 amounted to 3,385 tons of ore a day. This ore had an average grade 1.82% copper, and 0.10 ounce of gold a ton. A total of 1,235,776 tons of ore was mined during the year under review. In 1962, production at this mine totalled 1,322,711 tons of ore.

A total of 819,709 tons of ore was treated at the concentrator during the year. This ore, which was processed at the average daily rate of 2,245 tons, yielded 158,125 tons of copper concentrates and 194,698 tons of pyrite concentrates. The copper concentrates were treated in the smelter, whereas the pyrite concentrates were processed by cyanidation to recuperate its gold and silver content. After drying, a total of 178,148 tons of pyrite concentrates was shipped to manufacturers of sulfuric acid and other chemical products.

Apart from the copper concentrates, the smelter treated 415,292 tons of ore from the Horne mine, 299,708 tons of fluxing ore from the Don Rouyn sector, 108,078 tons of fluxing ore from the sector leased from Joliet Quebec Mines Limited, and 619,499 tons of other ores, concentrates, scrap and slag provided from various companies.

As during the preceding year, ore from the Horne mine was mined from stopes distributed between surface and the 2,975-foot level. Most of the ore treated came from pillar recovery by the cut-and-fill method of mining. After the mining of a total of 1,236,000 tons of ore, reserves were reduced to 1,033,000 tons.

The underground exploration program commenced in 1960 was continued during the year reviewed on the lower level of zone No. 5. Exploratory drifts were extended on the 7,000- and 8,000-foot elevations for a total distance of more than 3,000 feet, and diamond drilling was undertaken about the middle of October. The total length of drifts advanced between the 6,000- and 8,000-foot levels amounted to 5,203 feet.

Development work and stope preparation undertaken on the upper levels of the mine represented 6,717 feet of drifts and 599 feet of raises.

As of December 31, 1963, reserves at the Horne mine were calculated at 6,195,500 tons of copper ore carrying on the average 2.39% copper and 0.18 ounce of gold a ton, and also 271,200 tons of fluxing ore of an average tenor of 0.23 ounce of gold a ton.

In 1963, there were 1,758 employees.

In 1964 production of the Horne mine amounted to 3,140 tons a day. The average tenor of this ore was 2.01% copper and 0.19 ounce of gold a ton. In 1963 the daily production had been 3,385 tons of ore assaying an average of 1.82% copper and 0.10 ounce of gold a ton.

The 897,300 tons of ore treated in the concentrator, for a daily average of 2,450 tons, gave 184,500 tons of copper-gold concentrate and 252,000 tons of pyrite concentrate. The copper-gold concentrate was shipped to the smelter, whereas the pyrite concentrate was treated with cyanide for gold extraction. After being dried, 150,200 tons of pyrite concentrate was shipped to chemical product plants.

Moreover, the smelter treated 352,998 tons of ore from the Horne mine, 201,572 tons of flux ore from the Don Rouyn mine, 129,511 tons of flux ore from the mine rented from Joliet Quebec Mines, Ltd., and 766,738 tons of other ores, concentrates, waste and slag from the Geco mine and from other companies or industries.

As was the case during 1963, ore from the Horne mine came from stopes located between surface and the 2,975-foot level. Most of it came from the recovery of pillars through mining by the cut-and-fill method. After 1,250,000 tons had been mined, ore reserves showed a decrease of 980,000 tons.

During the year the program of underground exploration at the lower level of zone No. 5, inaugurated in 1961, was continued. About 28,400 feet of diamond drilling was done from the 7,000- and 8,000-foot levels over a length of about 4,000 feet, but with no results. This program is reported to be drawing to an end.

On December 31, 1964, ore reserves of the Horne mine amounted to 5,234,900 tons averaging 2.48% copper and 0.18 ounce of gold a ton, and to 252,600 tons of flux ore averaging 0.24 ounce of gold a ton.

In 1964 employees numbered 1,688. The manager was W.G. Brissenden.

NORBEAU MINES QUEBEC LIMITED, McKenzie Township, Abitibi-East

Development: gold

During the course of 1963, Norbeau Mines Quebec Limited decided to exploit the auriferous deposit that it holds in McKenzie township. The necessary preparatory work was started in August and, by year end, the shaft was sunk to 42 feet, a shaft-house was erected and most of the surface buildings belonging to the mill were laid out.

The program provides for five levels at depths of 180, 330, 480, 630 and 790 feet. When the preparatory work will have been completed, mining of the auriferous ore will be at the rate of 200 tons of ore a day. The ore will be processed by cyanidation.

About 20 men were working at this mine at the close of the year. The contractors were P. Harrison and Co. and Hill Clark and Francis.

In 1963 the mine manager was R.W. Dempsey.

In September, 1964, this company became the most recent producer and, at the same time, the first producer of precious metals in the Chibougamau-Chapais district.

Mining works proper done during the year included the sinking of a 809-foot-deep shaft giving access to five stations at 180, 330, 480, 630 and 780 feet from surface. From these stations 1,802 feet of drifting, 491 feet of cross-cuts, 816 feet of raises for ventilation and operation purposes and 620 feet of ore chutes were done. At each of the 480- and 780-foot levels a sump and a loading point were dug. Lastly, 2,399 feet of diamond drilling was done underground.

On surface, meanwhile, all buildings needed for a daily production of 200 tons were erected: headframe, hoist and dry-room, repair shop, offices and warehouse, treatment plant by the cyanide method, crushing and grinding room, boiler room and refinery plant.

From September to the end of December, 1964, 22,983 tons of ore was mined containing 9,949 ounces of gold and 1,240 ounces of silver with a gross value of $375,912. This ore came from the driving of drifts and of raises and from the preparation of stopes.

The main event of the year, apart from the celerity with which the mine was put into operation,was without doubt the discovery of a new vein, No. 4, during development work.

Ore reserves at the end of 1964, according to the company, amounted to 151,482 tons averaging 0.48 ounce of gold a ton. The mine employs 60 persons.

In 1964 the manager of the mine was Percy McCarthy.

NORLARTIC MINES LIMITED, Vassan Township, Abitibi-East

Producer: gold, silver

Norlartic Mines Limited shipped, during the year 1963, 163,087 tons of ore to the treatment plant of the mine of Malartic Gold Fields Limited, at the rate of about 447 tons a day. The average grade of the ore processed was 0.1397 ounce of gold a ton. During the preceding year, shipments amounted to 456 tons of ore a day and the ore assayed 0.128 ounce of gold a ton.

With the exception of some 14,500 tons of ore derived from the stope of zone "B", above the 500-foot level, all the remaining ore was recovered from the stopes of the principal zone, between the 250- and 1,000-foot levels.

Lateral development work was very much limited during the year under review, consisting of only 69 feet of drifts dug in the "B" zone on the 250-foot level. A raise was extended in zone "B" and some others were advanced in the Main zone for the purpose of outlining stopes. These operations amounted to 512 feet.

Underground, a total of 3,758 feet of diamond drilling was completed from the 1,000-foot level. Nearly half of this amount was undertaken to explore at depth the extension of the Main zone. Twenty-six drill holes, totalling 16,762 feet, were put down from surface. These holes were distributed on four sections of the property.

At the close of the year reviewed, ore reserves were estimated at 315,000 tons assaying 0.16 ounce of gold a ton.

The mine employed 58 persons under the direction of R.W. Dempsey, manager.

During 1964, ore shipments from this mine to the Malartic Gold Fields plant amounted to 165,596 tons containing 0.1261 ounce of gold a ton, representing about 454 tons a day compared with 447 tons a day assaying 0.1397 ounce of gold a ton, for the preceding year.

About 90% of the ore mined came from stopes of the Main zone distributed between the 375- and 1,000-foot levels. The remainder came from the mining of a stope in the north, or "B", zone at the 500-foot level.

At the 750-foot level, the main West drift was extended over a distance of 1,270 feet towards an ore zone discovered during diamond drilling from surface. Exploration drilling was executed from the 1,000-foot level. On surface, 18,253 feet of diamond drilling along the Main zone revealed the presence of an ore zone at about 3,600 feet northwest of the shaft.

On December 31, 1964, ore reserves were estimated at 170,000 tons containing an average of 0.15 ounce of gold a ton.

In 1964 M.D. Kennedy, mine manager, had 57 persons under his direction.

NORMETAL MINING CORPORATION LIMITED, Desmeloizes Township, Abitibi-East

Producer: copper, zinc, gold, silver, pyrite

In 1963, Normetal Mining Corporation Limited treated in its mill 346,000 tons of ore at the daily average of 948 tons, as compared with an average of 972 tons a day during the preceding year. The average grade of the ore milled was 2.65% copper, 5.33% zinc, 0.025 ounce of gold and 1.83 ounces of silver a ton. By way of comparison, the average content for the year 1962 was 2.71% copper, 5.17% zinc, 0.026 ounce of gold and 1.88 ounces of silver a ton.

Most of the ore treated was drawn from the stopes distributed on the group of levels of the internal shaft No. 4, between the depths of 3,070 and 5,560 feet.

Exploration and development work was concentrated on the levels established at 200-foot intervals between the depths of 6,160 and 6,765 feet, as well as that of the 4,615-foot elevation, where a drift was extended on the Jacmar section. A total of 6,921 feet of drifts was advanced during 1963. Out of this amount, about 1,900 feet of drifts was excavated on the 4,165-foot elevation. Moreover, 594 feet of raises was advanced, mostly on the lower levels of the zone, where the ore-pass and waste rock system was finished and where the ventilation system of the mine was extended at depth.

In 1963, underground diamond drilling for the purpose of exploration came to a total of 13,932 linear feet of holes, most of this drilling being done on the lower levels of the mine. From surface, the diamond drilling operations amounted to 3,326 feet of holes. Most of these holes were put down in the Jacmar section.

Ore reserves, at the close of 1963, were reported at 1,552,000 tons grading 2.5% copper and 8.3% zinc.

In 1964, the concentrator treated 953 tons of ore a day containing an average of 1.89% copper, 7.17% zinc, 0.024 ounce of gold and 1.75 ounce of silver a ton, coming from the Normetal property. The concentrator also treated 3,995 tons of ore averaging 2.66% copper, 2.20% zinc, 0.007 ounce of gold and 0.74 ounce of silver a ton, from the property under option adjacent to the Normetal property to the north. During the preceding year, the plant had treated daily 948 tons of ore averaging 2.65% copper, 5.33% zinc, 0.025 ounce of gold and 1.83 ounces of silver a ton.

The ore treated came from stopes distributed between the 1,685- and 5,760-foot levels.

Lateral development work was completed at all levels up to a depth of 6,765 feet and the preparation of stopes in the ore zone up to this depth, the deepest of the mine, was virtually completed.

The exploratory diamond drilling deeper than the 6,765-foot level was completed. In June, 1964, the company decided to sink a second internal shaft (No. 5), the opening of which was established at the 6,365-foot level. This shaft, at about 1,200 feet north of internal shaft No. 4, will be sunk to a depth of 7,965 feet.

At year end, digging of the hoist room at the 6,365-foot level was completed as well as the installation of the hoist on its foundations. The shaft had attained a depth of 229 feet under the latter level.

Exploration and development work completed during the year included the driving of 3,850 feet of drifts and cross-cuts and the excavating of 1,023 feet of raises.

Underground diamond drilling for exploration purposes amounted to 25,998 feet.

The above summary includes exploration made on the property under option situated north of the Normetal property and representing 353 feet of drifts and 7,363 feet of diamond drilling.

On December 31, 1964, without taking dilution into account, ore reserves were estimated at 1,545,000 tons averaging 2.38% copper and 8.91% zinc.

Employees of the mine, numbering 484 during both years, were under the management of R.J. Allen.

NORTHERN EXPLORATION LIMITED, Poirier Township, Abitibi-East

Development: zinc, copper, silver

Early in 1964, Northern Exploration Limited decided to undertake underground work with the aim of exploring in depth a zone that contained values in zinc, copper and silver and that had been discovered during diamond drilling done during the preceding year. For this purpose, a temporary mining installation was built on surface during summer, and the sinking of a vertical three-compartment shaft was begun around September 15.

At the end of December, 1964, the shaft had attained a depth of 606 feet and two stations had been established at the 300- and 600-foot levels. Sinking of the shaft to a depth of 650 feet will continue before the driving of drifts at the 300- and 600-foot levels.

Exploration diamond drilling from the surface totalled 28,356 feet in 1964. No underground drilling was done.

Ore reserves indicated by diamond drilling amounted to 816,000 tons averaging 7.75% zinc, 0.72% copper, and 1.10 ounces of silver a ton.

Sinking of the shaft was done by R.F. Fry and Associates Limited, who employed from 28 to 30 men.

Bert Bourgoin was resident geologist for Northern Exploration, Ltd.

OPEMISKA COPPER MINES (QUEBEC) LIMITED, Levy Township, Abitibi-East

Producer: copper, gold, silver

Opemiska Copper Mines (Quebec) Limited, which is situated in Levy township, produced concentrates containing 41,690,690 pounds of copper during the course of 1963. These concentrates also contained 17,242 ounces of gold and 276,653 ounces of silver. The cumulative value of the extracted metals was $13,969,601. The metals were recovered from a total of 737,543 tons of ore assaying 2.94% copper and a small percentage of precious metals.

The concentrator, which is in the same place, processed 2,021 tons of ore a day and recovered 96.0% of the copper metal contained therein. The concentrates shipped to the smelter at Noranda Mines Limited contained an average of 24.66% copper.

The year's highlights are the pre-production development of the Perry shaft deposit "B", the discovery of a deposit close to zone "D", termed the "Lower D", the outlining by diamond drilling from surface of the "Beaver Lake" deposit, fundamental research on a new flotation apparatus, and the establishing or rearrangement of the ventilation system at the Springer and Perry shafts.

Ore reserves at the close of the year reviewed were established as follows:

	Springer Mine		Perry Mine	
	Tons	% Copper	Tons	% Copper
Proved ore	2,818,000	3.27	1,824,000	3.21

At the end of the year 1963 there were 529 men employed, of which number 319 were working underground.

1) Preparatory work

a) Springer mine

The preparatory work carried out at the Springer mine in 1963 represented a total of 10,913 feet of drifting and 4,171 feet of raises. The drifts extended in zone No. 2 contributed an additional 2,866 linear feet of ore on the 1,300-, 1,475-, 1,650- and 1,825-foot levels.

b) Perry mine

Preparatory work at the Perry mine totalled 12,866 feet of drifts and 7,141 feet of raises. This work consisted mainly in the cutting of ore-passes, drifts and service raises.

2) Exploration

Exploration work done at the Perry shaft comprised 36,006 feet of diamond drilling from surface and 60,348 feet from underground. At the Springer shaft, 34,513 feet was carried out from below surface. The total work done was 94,861 linear feet.

During 1964, the company produced concentrates containing 40,709,632 pounds of copper, 16,966 ounces of gold and 281,797 ounces of silver for a total value of $14,177,236. These metals were extracted from a total of 748,990 tons of ore assaying 2.83% copper with,in addition, a low percentage of precious metals.

The concentrator treated daily 2,046 tons of ore and recovered 96% copper. The concentrates, shipped to the Noranda Mines Ltd. smelter, contained an average of 24.65% copper.

Proved ore reserves at year end, according to figures transmitted by the company, were as follows: at the Springer mine, 2,744,000 tons containing 3.25% copper and, at the Perry mine, 1,835,000 tons containing 3.09% copper.

The mine employed 551 men, 346 of which worked underground.

1) Development work

a) Springer mine

Development work done during 1964 represented a total of 7,771 feet of drifting and 2,353 feet of raises. Drifts driven in the No. 2 zone added 691 longitudinal feet of ore in vein No. 2 at the 1,300-, 1,475- and 1,825-foot levels.

b) Perry mine

At the Perry shaft, development work included 5,765 feet of drifts and 1,021 feet of raises. This work was aimed mainly at the preparation for mining of the "B" ore deposit.

2) Exploration work

Exploration work on surface consisted of a detailed geophysical survey and of 33,348 feet of diamond drilling.

The manager of the mine was F.G. Cooke.

ORCHAN MINES LIMITED, Galinée Township, Abitibi-East

Production: zinc, copper, gold, silver

The mill of Orchan Mines Limited commenced operations in the autumn of 1963. At the end of December the mill had treated 36,800 tons of ore drawn from Orchan Mines Limited and 42,804 tons of ore derived from New Hosco Mines Limited. The ore coming from the Orchan mine had an average tenor of 10.54% zinc and 0.89% copper, and that from the New Hosco mine, 1.96% copper.

The equipment of the mill was divided into two parts in order to process the ore coming from each mine in a separate operation. The part reserved for the treatment of the ore from the Hosco mine had a capacity of 900 tons a day and was put in operation about October 25, 1963. That part of the mill which was set aside for the processing of ore coming from Orchan Mines Limited was capable of handling 1,000 tons a day and milling started during the first week of November.

Most of the millfeed was drawn from the ore reserves stockpiled on surface. This ore was derived from development and stope preparation during the period that preceded the functioning of the mill. During the year 1963, these works comprised the digging of 10,512 feet of drifts and the driving of 6,244 feet of raises.

There was no diamond drilling carried out from surface. However, diamond drilling for exploratory purposes and for the outlining of stopes underground amounted to 3,955 feet.

Apart from the mill, construction of an administration building was also completed in the autumn on 1963.

It is reported that the ore reserves were calculated at 4,600,000 tons grading 12.41% zinc, 1.29% copper, 0.015 ounce of gold and 1.29 ounces of silver a ton.

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At the close of the year, this company had 150 employees under the direction of D. Bridger, general superintendent.

During 1964, the plant treated daily 1,009 tons of ore averaging 12.79% zinc and 1.06% copper from the Orchan mine. The plant also treated daily 902 tons of ore from New Hosco Mines Ltd. to produce copper concentrates.

The Orchan ore came mainly from stopes established in the Nos. 2 and 3 deposits and from development work and stope preparation accomplished in these two deposits.

During the year, a drift at the 352-foot level was driven towards Nos. 1 and 1A deposits that as yet had not been explored through underground work. In 1964 development and stope preparation work included 6,592 feet of drifts and 4,430 feet of raises. Most of this was done on the group of levels located between the 480- and 1,048-foot levels, mainly to develop Nos. 2 and 3 deposits and to prepare stopes in them.

Underground drilling for exploration and for the delimitation of known deposits totalled 21,662 feet. On surface exploration diamond drilling amounted to 1,976 feet.

Ore reserves at year end amounted to 2,985,950 tons averaging 11.55% zinc, 1.28% copper, 1.37 ounces of silver and 0.02 ounce of gold a ton.

In 1964 221 men were employed at this mine under the management of D. Bridger.

PATINO MINING CORPORATION, McKenzie and Roy Townships, Abitibi-East
(Copper Rand Mines Division)

Production: copper, gold, silver

The Copper Rand Mines division of Patino Mining Corporation mined deposits in the townships of McKenzie and Roy, Abitibi-East county. The concentrates produced during the course of the year 1963 contained 32,144,093 pounds of copper, 34,235 ounces of gold and 143,473 ounces of silver. These metals were extracted from 675,730 tons of ore assaying 2.47% copper, 0.062 ounce of gold and 0.31 ounce of silver a ton.

The concentrator, which is located at the Main mine, treated an average of 1,880 tons of ore a day and recovered 95% of the copper metal contained therein. The concentrates, which were shipped to the smelter at Noranda Mines Limited, contained an average of 25.65% copper.

The highlights of the year reviewed here were the deepening of the shaft at the Portage mine and the preparatory work incident to the setting up of five stations, the deepening of the shaft of the Jaculet mine and the establishing of four new stations, the commencement of mining operations of the deposit of Quebec Chibougamau Goldfields Limited and the exploration of the lower levels of the Copper Rand and Bouzan ore zones.

At the Copper Rand mine, the collar of a 2-compartment shaft, the No. 5, was established on surface by sinking the shaft to a depth of 28 feet. The remainder of the shaft will be excavated starting from an underground raise.

Ore reserves as of the end of 1963 were distributed as follows:

Mine	Tons	% Copper	Oz. Gold per Ton
Copper Rand	1,950,000	2.85	0.025
Bouzan	855,000	3.19	0.025
Jaculet	113,000	2.41	0.025
Portage	1,086,000	2.11	0.185
Quebec Chibougamau	138,000	1.97	0.095

The labor force at the close of the year reviewed here was 569 men.

1) Mining

Of the 675,730 tons of ore milled during the year 1963, 329,637 tons grading 2.67% copper came from the Machin, Eaton Bay, and Eaton Bay South zones of the principal mine. A total of 50,783 tons assaying 2.19% copper was derived from the Bouzan mine taken out by the same shaft. A tonnage of ore amounting to 33,874 tons carrying 2.77% copper was shipped from the Jaculet mine and 210,193 tons assaying 2.43% copper and 0.135 ounce of gold a ton, from the Portage mine. The yield from the mine of Quebec Chibougamau, mined under an agreement made in 1962, was 51,243 tons grading 2.01% copper and 0.083 ounce of gold a ton.

2) Preparatory work and exploration

a) Copper Rand

A total of 9,749 feet of drifting, 1,615 feet of raises, 1,825 feet of diamond drilling from surface and 33,302 feet from underground was completed at this mine.

b) Bouzan

This deposit experienced 4,231 linear feet of drifts, 1,246 feet of raises and 9,402 feet of diamond drilling from underground.

c) Jaculet

Mining operations at this mine ceased on October 1, 1963, in order to permit the deepening of the shaft to a depth of 1,340 feet, that is 615 feet of sinking with new stations established at the 750-, 900-, 1,050- and 1,200-foot levels. Before that, some 419 linear feet of drifting and 381 feet of raises had been advanced. A total of 3,174 feet of diamond drilling was completed.

d) Portage

During the first part of the year reviewed here, shaft sinking was extended 659 feet down to a total depth of 1,760 feet. New levels were established at elevations of 1,000, 1,150. 1,300, 1,450 and 1,600 feet. Digging of drifts and raises totalled respectively 3,656 and 1,938 feet. Underground diamond drilling totalled 22,255 feet.

During 1964, concentrates produced contained 30,513,559 pounds of copper, 39,986 ounces of gold and 186,006 ounces of silver. These metals came from 674,131 tons of ore assaying 2.36% copper, 0.067 ounce of gold and 0.35 ounce of silver a ton.

The concentrator treated daily an average of 1,862 tons of ore and recovered 96.14% copper. Concentrates shipped to the Noranda Mines Ltd. smelter averaged 25.36% copper.

Proved reserves at the end of 1964, according to the company, were as follows:

	Tons	% Copper	Oz. Gold
Copper Rand	1,538,000	2.36	0.025
Bouzan	482,000	2.64	0.025
Jaculet	183,000	2.04	0.025
Portage	1,194,000	2.12	0.157
Quebec Chibougamau	49,000	1.67	0.070

At the end of the year the number of men employed by the mine was 569.

1) Mining

Of the 674,131 tons of ore treated during 1964, 344,431 tons assaying 2.66% copper came from the Machin, Eaton Bay and Eaton Bay South zones of the main mine; 46,255 tons assaying 2.31% copper came from the Bouzan mine serviced by the same shaft; 21,622 tons assaying 2.18% copper was shipped from the Jaculet mine and 181,706 tons with 2.21% copper and 0.147 ounce of gold a ton came from the Portage mine. The Quebec Chibougamau mine, operated by virtue of an agreement concluded in 1962, contributed 80,117 tons assaying 1.90% copper and 0.088 ounce of gold a ton.

2) Development and exploration work

a) Copper Rand

At this mine 6,433 feet of drifts and 2,408 feet of raises were driven; 1,811 feet of diamond drilling from the surface and 37,345 feet of drilling underground were done.

b) Bouzan

At this deposit 1,331 feet of drifts and 1,150 feet of raises were driven.

c) Jaculet

Stoping was resumed during October. Previously and concurrently, the following exploration work was done: shaft sinking for an additional 18 feet, 11,216 feet of driving or extension of drifts and 993 feet of raises. Underground diamond drilling amounted to 7,139 feet.

d) Portage

At this mine 6,356 feet of drifts, 1,814 feet of raises and 23,631 feet of underground diamond drilling were done.

During 1963 and 1964 the manager of the mine was C.M. Campbell.

PEEL-ELDER LIMITED, Beauchastel Township, Rouyn-Noranda

Production: gold, silica

The name of the company Elder-Peel Limited was changed to that of Peel-Elder Limited about the month of December 1963.

Exploitation of the ore of this mine was temporarily suspended toward the month of November 1962 and deepening of the 3-compartment vertical shaft was commenced about the end of December of the same year. These operations were continued during the year 1963. The shaft, which had an initial depth of 1,765 feet, was sunk to a depth of about 2,600 feet. These works were terminated about April 22, 1963.

Four new stations were established at depths of 1,820, 2,020, 2,225, and 2,425 feet, and measuring hoppers were installed at depths of 2,095 and 2,505 feet.

Cross-cuts and drifts were opened up at the 1,820- and 2,020-foot levels only. An ore and waste pass system was introduced from the measuring hopper located at a depth of 2,095 feet to the 1,820-foot level. Toward the end of the year reviewed, work on the stope headings had commenced. Development work was conducted and resulted in 755 feet of shaft sinking, 4,202 feet of drifting and the driving of 1,054 feet of raises.

The ore derived from development work and stope preparation was shipped to the smelter of Noranda Mines Limited where it was used as flux. This ore amounted to 17,607 tons and had an average grade of about 0.14 ounce of gold a ton and 68.4% silica.

Diamond drilling for exploratory purposes was confined to below ground only and amounted to 860 feet of holes.

At the end of the year 1963, the mine employed 52 persons. A.H. Honsberger was the manager.

During 1964, the company continued the shipping of siliceous gold-bearing flux ore to Noranda Mines Limited smelter at a daily rate of 215 tons. This ore contained an average of 0.1213 ounce of gold a ton and 66.36% silica. The ore came mainly from stopes on the 1,820- and 2,020-foot levels.

Lateral development and stope preparation work completed during the year included 413 feet of drifts and 165 feet of draw points. Raises driven for the same purposes amounted to 484 feet.

Exploration diamond drilling was done underground only. The total footage amounted to 827 feet distributed in almost equal lengths on the 1,625-, 1,820- and 2,020-foot levels.

The company did not publish estimates of its ore reserves; it is believed, however, that reserves will last for another nine months of operation at the present rate of extraction.

The manager of the mine, W. Dent, had 56 employees under his authority.

MINES DE POIRIER INC. Poirier Township, Abitibi-East

Development: copper, zinc, silver

This subsidiary of Rio Algom Mines Ltd. holds the mining property that was previously known under the name of Projet Poirier of Rio Algom Mines Limited.

From January 1 to June 1, 1964, development and exploration work were continued on the 1,000- and 1,150-foot levels. At the 1,000-foot level, drifts were extended for a total length of 427 feet and three stations for diamond drills were established. Most of the lateral work was done at the 1,150-foot level where a total length of 3,643 feet of drifts was driven. Moreover, seventeen stations were established for diamond drills. During this same period, a 421-foot-long chute for steriles was driven from the 1,150-foot level to the 850-foot level.

During the month of June, lateral work was temporarily suspended in order to deepen the shaft. Work was started at a depth of 1,273 feet and completed on September 28 at a depth of 1,861 feet. Stations were established at the 1,300-, 1,450-, 1,600-, and 1,750-foot levels, and loading chutes were installed under the 1,750-foot level. The digging of an ore chute was started and the digging of a chute for steriles was continued. Lateral work was also started at the new 1,300-, 1,450- and 1,600-foot levels. At the end of 1964, the ore chute had reached a total length of 292 feet, and the sterile chute, 862 feet. Underground diamond drilling for exploration purposes totalled 32,971 feet. No diamond drilling from the surface was reported in 1964.

Ore reserves were reported at 3.5 million tons averaging 1.74% copper, 3.63% zinc, and 0.5 ounce of gold a ton.

During the year the company decided to prepare the mine for operation in the near future. A sample weighing about 100 tons was taken from the 1,000- and 1,150-foot levels to allow tests for ore treatment.

Shaft sinking and development works were conducted by R.F. Fry and Associates Ltd., who employed about 35 men on this property.

The manager for Mines de Poirier Inc. was R.T. Cook.

PREISSAC MOLYBDENITE MINES LIMITED, Preissac Township, Abitibi-East

Development: molybdenum, bismuth

In the summer of 1963, Preissac Molybdenite Mines Limited decided to construct a mill that would have a daily capacity of 600 tons. Some of the buildings of the temporary mining installation were replaced by permanent constructions. At the close of the year, the office buildings, the warehouse, a fitting and repair plant, a new cloak and dry house, etc. were completed, as well as a large part of the mill, which should be ready for operations about the beginning of June 1964.

The 3-compartment vertical shaft was deepened about 229 feet during the months of June and July, in order to reach a new depth of 825 feet, and a new station was established at the depth of 700 feet. During the course of the year 1963, development work was in progress on the five levels established at 125-foot intervals. This work comprised the digging of 7,228 feet of cross-cuts and drifts, and the boring of 768 feet of raises.

During the last months of the year, the underground operations consisted especially in preparation of the mine with a view to production, which should start about the beginning of June 1964. Measuring hoppers were installed at the depth of 750 feet, and an ore and waste pass system, which will extend to the 200-foot elevation, was commenced. The raises excavated for this purpose amounted to 569 linear feet.

The ore derived from development work and stope preparation was piled on the surface. The quantity of ore that was hoisted during 1963 came to 10,281 tons.

Diamond drilling for exploratory purposes was carried out from below surface on all levels. In all, 28,157 feet of bored holes was completed. No drilling was done from surface during the year reviewed here.

The number of employees at this mine increased progressively from 30 at the beginning of the year to 120 at the end of December 1963.

The construction of a concentrator with a daily capacity of 600 tons of ore, started in 1963, was completed at the end of June 1964. The plant was put into operation towards July 3 and, at the end of December, 1964, had treated 74,414 tons of ore averaging 0.249% molybdenite and 0.03% bismuth.

Most of the ore treated came from development work and from the preparation of stopes at the 325-, 450- and 575-foot levels.

In 1964, development and preparation works included 14,706 feet of drifts and cross-cuts as well as 1,148 feet of sub-drifts and draw points. Moreover these works necessitated the digging of a total of 5,200 feet of raises, 1,076 feet of which were ore and sterile chutes and 908 feet were ventilation chutes.

Diamond drilling for underground exploration purposes totalled 25,887 feet in 1964. On surface, during this same period, 7,456 feet of diamond drilling was done in the south part of the property with the aim of discovering additional ore deposits.

Towards the end of summer, the company decided to enlarge its plant to bring its daily capacity to 1,200 tons. Construction work on this new part of the plant was started around October. Among other construction work started in 1964 were a new building for the 100-foot hoist, a new compressor room, an enlargement of the dryer and of laboratories for the analysis of ore samples, and lastly a building for the main ventilator of the mine as well as for the air heating system for ventilation.

The number of permanent employees was gradually increased during 1964 and attained 168 at the end of December. During 1963 and 1964 the manager was Bernard Joyal.

QUEBEC CARTIER MINING COMPANY, Conan Township, Duplessis

Producer: iron concentrate

During 1963, the concentrator of Quebec Cartier Mining Company at Lac Jeannine produced 6,431,000 long tons of concentrates having an average tenor of 65.9% iron.

A grand total of 14,000,000 long tons of ore and 6,700,000 long tons of waste rock was extracted from the open-pit during this period. The average grade of the ore was 32.0% iron. The recuperation in iron from the process of concentration was 85.1%, whereas the residues contained 8.1% iron.

In the open-pit operations, nine benches each of a height of 40 feet were mined during the course of the year. The working faces of all these benches were located in the east part of the open-pit mine.

The mobile unit for the crushing of rock handled approximately 20,000 tons of rock in 1963. This rock was used mainly for the maintenance and construction of mine roads.

L.J. Patterson, vice-president, was in charge of operations at Gagnon.

During 1964 the concentrator produced 8,689,036 long tons of concentrate assaying 66.07% iron, 0.019% phosphorus, 5.16% silica, 0.04% manganese and 0.65% Al_2O_3. Drying of concentrate in winter eliminates an average of 2.19% water.

In 1964, 19,714,899 tons of ore was mined from the open-pit; 5,918,900 cubic yards of steriles and 488,000 cubic yards of overburden were removed. The average tenor of the ore was 33.4% iron.

Between the 1,760- and 2,090-foot elevations, nine 40-foot-high benches are mined.

In 1964 the manager was R.R. Ross.

QUEBEC CHIBOUGAMAU GOLDFIELDS LIMITED, McKenzie Township, Abitibi-East

Producer: copper, gold

The deposit of Quebec Chibougamau Goldfields Limited is exploited by Patino Mining Corporation in virtue of an agreement which gives its Copper Rand division the direction of the exploitation and charge of treating the ore found there.

1) Mining

Production commenced about the middle of the year. A total of 51,243 tons of ore carrying 2.01% copper and 0.085 ounce of gold a ton was shipped to the treatment plant of the Copper Rand mine. The ore was derived from stopes on the 350-, 500-, 650- and 800-foot elevations.

2) Preparatory work and exploration

Preparatory work amounted to 1,335 feet of drifts and 1,561 feet of raises. The exploration work consisted in 1,282 feet of diamond drilling.

These operations gave employment to 49 men at the end of the year in review.

The manager of the mine was C.M. Marshall.

During 1964, 80,117 tons of ore was shipped for treatment to the concentrator of the Copper Rand mine. This ore contained 1.90% copper and 0.088 ounce of gold a ton. Most of it came from stopes distributed at all levels of the mine.

Stoping and development work necessitated 2,805 feet of drifts and 1,182 feet of raises. Moreover 515 feet of diamond drilling was done from surface and 6,826 feet,from underground workings.

Ore reserves at the end of the year, according to the company, amounted to 49,000 tons containing 1.67% copper and 0.070 ounce of gold a ton.

In 1964 the mine employed 45 men under the direct authority of H. Schumacher, chief captain. C.D. Marshall of Patino Mining Corporation was the manager.

QUEBEC IRON AND TITANIUM CORPORATION, Parker Township, Duplessis

Producer: ilmenite

The mine of Quebec Iron and Titanium Corporation, which is situated near Lac Allard, 27 miles north of Havre Saint-Pierre, was in operation from April 28 to October 21, 1963.

A total of 770,000 long tons of ore, of which 60,000 long tons came from stock-piled reserves, was shipped to the company's refinery at Sorel.

A strike of the employees at the refinery at Sorel that lasted from the month of August 1962 to the month of March 1963 was the cause of the premature closing down of the mining season as well as the reduced production for the year reviewed. The output for the year 1962 was 1,370,000 long tons of ore.

The mine employed 219 persons in 1963.

From April to the end of August, 1964,the mine shipped 740,000 long tons of ore. A production of 1,200,000 long tons was foreseen for 1964.

Ore shipped to the Sorel refinery of the company contains 75% ilmenite and hematite. Most of it came from the area northwest of the open-pit. Five 35-foot benches were worked.

The superintendent of the mine was S.A. Luciani.

QUEMONT MINING CORPORATION LIMITED, Rouyn Township, Rouyn-Noranda

Production: copper, zinc, gold, silver

During the year 1963, the concentrator of Quemont Mining Corporation Limited processed 2,200 tons of ore a day. This is virtually the same daily treatment as during the preceding year. The content of the ore treated was 1.22% copper, 2.21% zinc, 43.2% pyrite, 0.16 ounce of gold and 0.79 ounce of silver a ton. The ore mined during the preceding year graded 1.25% copper, 2.64% zinc, 45.7% pyrite, 0.167 ounce of gold and 0.86 ounce of silver a ton.

The ore was derived from stopes distributed between the 200- and 3,420-foot levels, with the exception of the 560- and 1,080-foot levels. About 60% of the ore was mined from open stopes exploited by deep blast-hole methods. The remainder of the ore came from stopes mined by cut-and-fill methods.

Lateral development work was concentrated on the group of levels situated between the 2,160- and 3,870-foot depths, and consisted in the advancing of 4,116 feet of drifts. Raises cut during the course of the year reviewed amounted to a total of 553 feet.

Exploration at depth of a layer of breccia favorable to mineralization, in the northern part of the property, was continued according to plan. This work consisted in driving 2,290 feet of drifts, on the 2,340-foot level, in the establishing of stations for diamond drilling, and in the diamond drilling at this elevation and at depth.

Diamond drilling from below surface for the purpose of exploration, or for the outlining of stopes and orebodies, reached a total of 88,915 feet including 2,408 feet of holes bored from underground workings of the Noranda Mines Limited on a custom basis for Quemont Mining Corporation Limited. The diamond drilling put down from surface amounted to only 2,547 feet.

After the extraction of 803,000 tons of ore in 1963, reserves at the mine were calculated at 3,360,000 tons having an average grade of 1.27% copper, 2.86% zinc, 48% pyrite, 0.168 ounce of gold and 1 ounce of silver a ton.

During 1964 the concentrator of the mine treated daily 2,057 tons of ore averaging 1.16% copper, 2.38% zinc, 42% pyrite, 0.144 ounce of gold and 0.70 ounce of silver a ton. During the preceding year the plant had treated daily 2,200 tons of ore with an average tenor of 1.22% copper, 2.21% zinc; 43.2% pyrite, 0.16 ounce of gold and 0.79 ounce of silver a ton.

Ore came from stopes distributed between the 200- and 3,570-foot levels.

Lateral exploration, development and stope preparation work included 3,796 feet of drifts and cross-cuts. Raises driven for the same purposes during the year amounted to 4.700 feet. About half of the lateral exploration was carried out between the 1,080- and 2,340-foot levels.

The driving of exploration drifts at the 2,340-foot level with a view to establishing stations was completed, but drilling was continued from these points. Diamond drilling for underground exploration attained a total of 74,768 feet. No diamond drilling was done from surface. No important ore deposit was discovered during the year.

During 1964 a new estimate of ore reserves was made and 290,000 tons, located only a few feet under Osisko lake, was eliminated because of the impossibility of determining the proportion of the deposit that could be mined under reasonably safe conditions.

Consequently ore reserves were estimated at the end of the year at 2,290,000 tons averaging 1.23% copper, 2.61% zinc, 50% pyrite, 0.170 ounce of gold and 0.99 ounce of silver a ton without taking into account dilution.

The number of employees gradually went from 575 in early 1964 to 550 towards the end of the same year. The manager was A.G. Ballachey.

RIO ALGOM MINES LIMITED, Poirier Township, Abitibi-East
(Poirier Project)

Development: copper

At the beginning of the year 1963, Rio Algom Mines Limited decided to undertake underground operations in order to explore at depth the copper zone that had been discovered during the preceding year. To this end a temporary mining installation was built on the surface, and the sinking of a 3-compartment vertical shaft was commenced on April 15, 1963.

The shaft was terminated at a depth of 1,275 feet on October 13. Seven stations were established at depths of 250, 400, 550, 700, 850, 1,000 and 1,150 feet, and lateral exploration and development work were commenced on the 1,000- and 1,150-foot levels at the beginning of November.

At the end of December, 1963, the south cross-cuts were extended to the ore zone on these two elevations and the east and west drifts were commenced.. This work amounted to a total of more than 2,210 feet of drifting.

Diamond drilling from below surface for the purpose of exploration was confined to the 1,000-foot elevation and drill holes totalling 1,564 feet were put down. Only 300 feet of diamond drilling on the surface was completed during the year 1963.

It is reported that ore reserves indicated by diamond drilling were calculated to be 1,000,000 tons assaying about 3% copper.

SIGMA MINES (QUEBEC) LIMITED, Bourlamaque Township, Abitibi-East

Production: gold, silver

During the year 1963, the quantity of ore processed at the mill of the mine of Sigma Mines (Quebec) Limited amounted to 423,058 tons, which was an average of 1,160 tons a day. This amount is almost identical to the total treated during the preceding year. The tenor of the ore milled was 0.193 ounce of gold a ton.

The ore was extracted mainly from stopes located between the 600- and 3,150-foot elevations, of which about 27% was derived from cut-and-fill stopes between the 2,250- and 3,150-foot levels.

About 10% of the ore treated came from development works that were carried out between the 1,475- and 4,050-foot levels. It was, however, from the 2,100-foot level downward that most of the drifts were extended.

On the 1,475-foot level, in the west part of the mine, a drift was advanced toward the south 565 feet on the property of the Lamaque mine, for that company which did its own drilling. On the 2,100-foot elevation, Gamma Mines (Quebec) Limited, situated to the west of the Sigma mine, extended two drifts totalling 79 feet and did some drilling in its mine for its own production.

Diamond drilling, other than that already mentioned, was concentrated in the zones in operation between the 1,600- and 4,050-foot levels.

A ventilation shaft was completed between the 3,600- and 3,450-foot elevations.

As of December 31, 1963, ore reserves were estimated at 1,345,000 tons, of which 820,400 tons had a tenor of 0.226 ounce of gold a ton. These reserves were virtually the same as those for the preceding fiscal year.

Minor changes took place on surface, such as enlarging the repair shop, changing the compressed-air reservoirs, and the addition of a compressor.

The mine employed 368 persons during 1963.

During 1964 the plant treated 439,134 tons of ore, a daily output of 1,203 tons averaging 0.186 ounce of gold a ton. The quantity of gold obtained was almost equal to that obtained during the preceding year when 423,058 tons of ore averaging 0.193 ounce of gold a ton had been treated.

Ore came mainly from stopes located between the 850- and 3,150-foot levels; about 31% of these stopes were of the cut-and-fill type and were distributed between the 1,975- and 3,150-foot levels.

Development work between the 1,350- and 4,050-foot levels contributed about 7% of the ore treated. This included 449 feet of drifts driven at the 2,250-foot level for Gamma Mines (Quebec) Limited on this company's property.

Diamond drilling was done at most of the levels between 850 and 4,050 feet. At the 1,475-foot level, the Lamaque mine continued diamond drilling on its own property from drifts in the Sigma mine.

In April 1964 deepening of the internal shaft was started. At year end, this shaft had attained a depth of 5,000 feet. Stations were established at the 4,250-, 4,400-, 4,550-, 4,700-, 4,850- and 5,000-foot levels.

On December 31, 1964, ore reserves were estimated at 1,394,230 tons, 894,000 tons of which assayed 0.228 ounce of gold a ton. These reserves were practically the same as for the preceding year.

In 1964 the mine employed 335 persons. The manager was F.J. O'Connell.

SOLBEC COPPER MINES LIMITED, Stratford Township, Wolfe

Underground operations: copper, lead, zinc, gold, silver

During the course of the year 1963, operations at the mine of Solbec Copper Mines Limited were suspended because of a strike which lasted from March 1 to July 29, that is 151 days.

The quantity of ore processed in the mill amounted to 185,573 tons, for an average daily rate of 1,000 tons.

The ore was supplied by the mining of underground stopes above the five upper levels, following the cut-and-fill method of mining. The backfill material is a mixture of sand and tailings from the treatment mill.

Development work comprised 2,464 linear feet of drifts, excavated mainly on the 5, 7 and 12 levels for the purpose of making possible the carrying out of a program of exploration through diamond drilling.

A total of 586 feet of raises was cut between the 5, 8, 11 and 12 levels for an ore pass to the loading chute on the bottom elevation.

The total quantity of rock mined during 1964 was 789,621 tons, 518,580 tons of which was treated at the plant for a daily average of 1,500 tons.

Underground regularly-operated stopes, located above the first four levels, contributed a total of 321,177 tons and the open-pit furnished 197,403 tons. The quantity of steriles taken off at this place was 271,041 tons. To uncover the ore, 260,000 cubic yards of overburden had to be stripped.

Development work included 8,101 feet of drifts on Nos. 5, 6, 7, 8, 9, 10, and 12 levels as well as 2,140 feet of chutes that were dug above the Nos. 7, 8, 10, and 12 levels.

During 1963 and 1964, the manager of the mine was R.B. Gosselin.

ST. LAWRENCE COLUMBIUM AND METALS CORPORATION, Annonciation Parish,
Deux-Montagnes

Producer: columbium pentoxide concentrates

The concentrator of St. Lawrence Columbium and Metals Corporation at Oka treated 306,000 tons of ore during 1963. The production was 2,937,200 pounds of concentrates containing more than 50% columbium pentoxide.

The work was carried out on the A-3 deposit and, at the close of the year under review, the open-pit had attained a depth of 120 feet. Extraction of the ore necessitated the removal of 376,000 tons of overburden and 1,118,800 tons of waste rock.

In 1963 this company employed 100 men, of whom 56 worked in the open-pit.

During 1964 the plant treated 336,800 tons of ore which produced 2,163,358 pounds of concentrates containing more than 50% columbium pentoxide.

Two open-pits, Nos. 1 and 2, were operated during the year. Their respective depths were 90 and 180 feet. Ore extraction necessitated the stripping of 1,785,500 tons of sterile rock.

Studies are presently under way with a view to determining the possibility of continuing mining operations through underground methods.

J.-C. Caron was the manager of the mine.

STURGEON RIVER MINES LIMITED, Lesueur, Abitibi-East

Development: gold, silver

On the property of Sturgeon River Mines Limited, the 3-compartment vertical shaft, the sinking of which was commenced toward the end of the year 1962, was completed to a depth of 1,111 feet about the end of July 1963.

Six stations were established at intervals of 150 feet between the depths of 175 feet and 925 feet, and the measuring hoppers were set up at the depth of 1,025 feet. The lateral development work was concentrated on the 475-foot level where a cross-cut of 96 feet was extended to the vein.

Exploratory diamond drilling from below surface totalled 5,247 feet of bored holes, whereas the drilling carried out from surface for the same purpose amounted to 4,114 feet.

All development work was suspended for an indefinite period about October 24, 1963.

Ore reserves indicated by diamond drilling were reported at 488,000 tons assaying 0.326 ounce of gold a ton.

The manager was J.R. Harrison.

SULLIVAN CONSOLIDATED MINES LIMITED, Dubuisson Township, Abitibi-East

Producer: gold, silver

In 1963, the mill of Sullivan Consolidated Mines Limited treated a total of 258,348 tons of ore at the rate of 708 tons a day, the

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same daily rate as that of the preceding year. The difference between this tonnage and the quantity drawn from underground is 32,018 tons of semi-sterile rock,which was taken to the crusher. The grade of the processed ore is virtually the same as that for the preceding year, that is 0.192 ounce of gold a ton.

The processed ore was derived mainly from veins Nos. 4, 9, 12 and 16, at various depths between the 850- and 2,375-foot levels, whereas smaller quantities were extracted from veins Nos. 2, 49, A, 14 and other veins situated near shaft No. 1.

Lateral development work, as well as diamond drilling, was carried out between the 1,750- and 3,000-foot elevations, in veins Nos. 9, 12 and 16.

Between the 1,550- and 1,450-foot levels, raises were pierced which will serve as waste-rock passes.

Diamond drilling from surface was carried out from Dubuisson lake.

As of December 31, 1963, ore reserves were estimated at 647,372 tons grading 0.218 ounce of gold a ton. This tonnage is virtually the same as that for the close of the preceding year.

In 1964 the plant treated 253,510 tons of ore representing a daily tonnage of 694 tons, compared to 708 tons daily during the preceding year. The difference between this tonnage and the quantity mined underground is 37,289 tons of almost sterile rock that was sorted at the crushing plant. Ore treated assayed 0.158 ounce of gold a ton,which is much lower than for the preceding year when the tenor of ore was 0.192 ounce of gold a ton.

Ore treated came from veins Nos. 4, 9, 12, 16, and "A" at various levels between the 850- and 2,625-foot depths in the area of shaft No. 2. Low quantities were drawn from other veins in the neighborhood of this shaft, as well as a certain quantity from the area of shaft No. 1 at the 950-, 1,050-, and 1,150-foot levels.

A total of 5,241 feet of drifts was driven, mainly in veins Nos. 9 and 12 at various levels between the 1,350- and 2,625-foot levels, and in vein No. 16 on the 2,500-, 2,625 and 2,875-foot levels. Other veins in which work was done are Nos. 3, 4, 10, 49, and 94 veins.

Underground diamond drilling totalled 66,370 feet and was aimed at delimiting the extension of the known veins. On surface, 3,787 feet of diamond drilling was done on Dubuisson lake, at the beginning of the year.

On December 31, 1964, reserves were estimated at 621,700 tons assaying 0.211 ounce of gold a ton. This tonnage is slightly lower than the 647,372 tons reported for the preceding year.

The total number of men employed at this mine amounted to 269 in 1963 and 266 in 1964. The manager was J.-P. Bonneville.

UNITED OBALSKI MINING COMPANY LTD. Obalski and McKenzie Townships,
Abitibi-East

Production: copper, gold

During 1964 United Obalski Mining Co. Ltd. commenced mining an ore deposit in Obalski township,Abitibi-East. Operations, given for management at the close of 1963 to a joint company called Merrill-Obalski Mines Ltd., were once again taken over by the owners, United Obalski,in August 1964, which thereafter took charge of the operations with aid from employees of the firm Evert Ross and Associates.

During the year, 7,389 tons of ore assaying 1.15% copper and 0.053 ounce of gold a ton was shipped and treated on a custom basis at the Merrill Island Mining Corp. concentrator. At year end, 20,385 tons of ore had been mined and kept in reserve at the stopes; this ore assayed 1.65% copper and 0.109 ounce of gold a ton.

Ore reserves, according to the company, amounted to 180,000 tons assaying 2.00% copper and 0.10 ounce of gold. Ore mining and preparation of the mine for its operation necessitated the deepening of the shaft an additional 38 feet to attain a total depth of 310 feet, 1,637 feet of drifts including 224 feet of haulage drifts, and 770 feet of raises. All this work was done at the 2nd level (224 feet) of the mine.

Furthermore 2,500 feet of diamond drilling was done from surface and 650,from underground workings. The following surface buildings were installed or completed during 1964: the headframe and an adjacent building with a storage capacity of 5,000 tons of ore, a building for the hoist and the compressor, a repair shop and a building containing the dryer, offices and the warehouse.

Electric power is now provided by Hydro-Quebec.

The mine employed 60 men under the management of J.T. Hagan.

UTUFORA MINES LIMITED, LaMotte Township, Abitibi-East

Development: molybdenum, bismuth

This company, Utufora Mines Limited, which was formed at the beginning of the summer of 1963, undertook development work on a molybdenum and bismuth deposit situated at the center of lot 5, range II, LaMotte township.

A road was built for a distance of one and a half miles in range II to the orebody, and the overburden covering this deposit was removed.

It is reported that a 600-pound sample was shipped to the laboratory at Ottawa during the month of July, and two other samples were sent to the mill of Molybdenite Corporation of Canada Limited. The first of the latter samples was shipped about November 28 and contained 400 tons of ore. The second sample was sent to that mill about November 30 and comprised 800 tons of ore. From these two samples, the ore should have an average tenor of 0.25% molybdenite (MoS_2) and 0.042% bismuth.

Ore reserves were calculated at 140,000 tons assaying $4.59 a ton in recuperable molybdenum and bismuth.

VAUZE MINES LIMITED, Dufresnoy Township, Rouyn-Noranda

Producer: copper, zinc, gold, silver

During 1963, the mill of Vauze Mines Limited treated 115,878 tons of ore assaying an average of 3.14% copper, 2.42% zinc, 0.025 ounce of gold and 0.95 ounce of silver a ton. In the previous year, the mill processed 109,242 tons of ore assaying 4.64% copper, 4.29% zinc, 0.037 ounce of gold and 1.79 ounces of silver a ton.

The ore was derived from stopes distributed between surface and the 720-foot level in the south and north zones. The amount of ore mined from the north zone was increased during the course of the year reviewed in order to compensate for the smaller tonnage derived from the south zone, the reserves of which had become almost exhausted during this same year.

Development work consisted in the cutting of 971 feet of drifts and the excavation of 1,816 feet of raises. The greater part of this work was carried out in the north zone on the 375-, 550- and 720-foot levels.

Underground diamond drilling for development purposes was undertaken mainly in the north zone, on the 375- and 720-foot elevations. This work totalled 12,564 linear feet. Diamond drilling amounting to 12,476 feet was put down from surface into those sections of the property that were considered the most favorable for the discovery of new orebodies.

At the plant, a small ball-mill was added to the treatment circuit in order to increase the capacity to 370 tons a day. It is reported that the recovery of zinc was discontinued toward the end of October because of the very low tenor of zinc of the ore milled since that date.

Ore reserves of the mine were calculated at 105,000 tons grading on the average 1.6% copper, as of the end of the year 1963. The number of employees decreased from 105 at the beginning of the year to 85 at the end of 1963.

E.P. Graham was the manager of this mine.

In 1964 the company plant treated 139,026 tons of ore averaging 1.6% copper, compared to 115,878 tons averaging 3.14% copper and 2.42% zinc in 1963. Most of the ore came from the north zone between the 375- and 720-foot levels. Because this zone contained little or no zinc, zinc concentrate was not produced during the year.

No drift was driven during 1964 but early in the year a short raise was dug between the 550- and 375-foot levels.

Diamond drilling for underground exploration purposes totalled 706 feet. On surface 1,865 feet of diamond drilling was done on portions of the property that were considered as the most favourable for the discovery of new deposits.

At year end, ore reserves were considered to be scarcely sufficient to operate the plant another month.

Employees, which numbered 85 at the end of 1963, numbered only 55 towards the end of 1964. The manager at that time was W. Griffin.

WASAMAC MINES LIMITED, Beauchastel Township, Rouyn-Noranda

Development: gold, silver

The name of this company, which formerly was Lake Wasa Mining Corporation Ltd., was changed to Wasamac Mines Ltd. on August 31, 1960.

During the period from 1945 to 1950, a 3-compartment shaft, inclined at 55°, had been sunk to a depth of 1,050 feet and development work had been done at the 200-, 400-, 600-, 800-, and 1,000-foot levels. Ore reserves amounted to 2,370,000 tons averaging 0.154 ounce of gold a ton.

In early 1964 the company decided to operate the mine. Underground workings were dried out, a new mining installation was erected and the construction of a plant with a daily capacity of 1,500 tons was started. At the end of the year a new 100-foot-high headframe was completed, as well as the office building, the combined building for the warehouse, dryer, hoist and compressors and, lastly, the building for the repair and adjusting shop as well as the carpentry shop.

The inclined shaft was sunk an additional 54 feet and development and stope preparation works were started at all levels. During 1964 these works included 1,300 feet of cross-cuts and drifts, the digging of 488 feet of ore chutes and 205 feet of other raises for the preparation of stopes. About 940 tons of ore coming from these works was hoisted and dumped on surface.

Underground diamond drilling for exploration purposes amounted to 2,543 feet. On surface 1,025 feet of diamond drilling was done during 1964.

In December, 1964, employees numbered 99. The general superintendent was E.S. Short.

NON-METALLIC MINES

ALUMINUM COMPANY OF CANADA, Hull Township, Gatineau

Producer: magnesium oxide, lime

Mining operations were carried out during the year under review on the Cross deposit of Aluminum Company of Canada at Farm Point.

Three benches were exploited by the cutting of sides on the 390-, 425- and 450-foot elevations. Production of ore destined for the mill at Wakefield averaged 10,000 tons a month during 1963.

The company employed 100 persons during 1963.

In 1964 the quarry produced monthly an average of 16,000 tons of ore.

The mining of brucitic limestone was done on the 390- and 425-foot benches of this deposit located on the flank of a hill.

The manager was J.B. Gneadinger.

LES AMENDEMENTS CALCAIRES DE LA RIVIÈRE BLEUE ENRG. - Cabano, Temiscouata

In 1964 this firm operated two limestone quarries and a crushing and pulverizing plant.

One of the quarries, located close to the plant, was closed during the summer. The second, located in Saint-Eusèbe range, 4 1/2 miles from the first, was opened towards the end of the summer.

The quantity of rock extracted during 1964 was 30,000 tons. The whole production was pulverized and sold as agricultural lime.

The manager was Léo Lavoie.

ASBESTOS CORPORATION LIMITED, Thetford Township, Mégantic

Production: asbestos

Asbestos Corporation Limited operates under the name of King-Beaver mine an asbestos deposit and fiberizing plant with a daily capacity of 6,000 tons in Thetford township; under the name of British Canadian mine an asbestos deposit and two fiberizing mills with a daily capacity of 4,000 and 5,000 tons respectively, on lots 30 and 31, range B, and on the northeast part of Block A, Coleraine township,and, lastly, under the name of Normandie mine, an asbestos deposit and fiberizing plant with a daily capacity of 5,000 tons, situated on lot 25, range III, Ireland township.

During the course of the year 1963, the three mines of Asbestos Corporation Limited, namely, King-Beaver, British Canadian and Normandie, operated at full capacity.

The tonnage of ore treated was 10% less than that of the preceding year.

At the British Canadian and Normandie mines, mining was by open-pit methods, whereas at the King-Beaver mine, production was from open-pit operations and from underground stoping at the King mine. The quantity of ore extracted at this last mine from underground workings represents 47% of the quantity supplied at the King-Beaver.

The quantities of ore extracted from each of British-Canadian, King-Beaver and Normandie mines were respectively 1,484,000 tons, 1,342,000 tons and 1,278,000 tons for an average of 5,300, 5.700, and 5,324 tons a day.

In 1963 the manager of these mines was C.H. McNaughton.

On May 1, 1964, the company acquired the properties of Johnson's Company Limited in Thetford township and of Johnson's Asbestos Company Limited in Coleraine township. The Thetford Township property was annexed to the adjacent King-Beaver mine and the Coleraine Township property was annexed to the neighboring British Canadian mine.

Following this transaction ore reserves of Asbestos Corporation Limited were raised from 97,140,000 tons to 127,420,000 tons on December 31, 1964. Reserves are distributed as follows: King-Beaver, 39,520,000 tons, British Canadian, 57,150,000 tons; Normandie, 16,150,000 tons and other properties, 14,600,000 tons.

The following comparative table summarizes activities for 1963 and 1964:

	1962	1963	1964
Rock broken	15,484,620 tons	17,015,000 tons	18,312,014 tons
Rock broken daily	60,800 tons	60,800 tons	78,443 tons
Ore treated	4,104,000 tons	4,104,000 tons	5,513,118 tons
Ore treated daily	16,324 tons	16,324 tons	22,774 tons
Stripping	484,300 cu.yds.	484,300 cu.yds.	632,381 cu.yds.

Mining was done in open-pits at British Canadian, King-Beaver and Normandie mines and in underground workings at the King-Beaver mine. In the last-mentioned one, the quantity of ore from underground workings of the King and Johnson mines represented 23% of the total from the King-Beaver mine.

The quantity of ore treated in each of the British Canadian, King-Beaver and Normandie mines was, respectively, 2,300.532 tons, 1,836,362 tons and 1,376,224 tons, with a daily average of 9,500, 8,450 and 5,750 tons respectively.

During June, 1964, fiberizing in the Johnson mill at Thetford Mines and extraction in the open-pit operation of Johnson's Asbestos Company at Black Lake were suspended.

In 1964 the manager of production was F.A. Cunnington.

BAKER TALC LIMITED, Potton Township, Brome

Underground mining: soapstone, talc

Baker Talc Limited mines a deposit of soapstone and talc on cadastral lots 606 and 607, range V, Potton township, and also operates a pulverizing mill located on lot 6, range II, of the same township.

During 1963, the quantity of ore extracted was about 10,000 tons. The talc is reduced to a powder and bagged for the market. A certain amount, that is 80 tons, was sold in block form for use in sculpturing.

Mining is carried out by means of underground stopes above a drift at the 165-foot elevation. These stopes are reached by a 2-compartment shaft inclined at 45 degrees.

During 1964 the quantity of rock extracted was 9,500 tons. About 125 tons was sold in blocks for sculptors. The remainder was pulverized and marketed in bags.

J.H. Morgan was manager of the enterprise.

BELL ASBESTOS MINES LIMITED, Thetford Township, Mégantic

Production: asbestos

Bell Asbestos mined an asbestos deposit on lot 27, range V, Thetford township, and worked a fiberizing mill of a daily capacity of 2,000 tons.

During 1963, the quantity of ore extracted by the Bell Asbestos Mines Limited was 748,000 tons, of which 700,000 tons was milled at an average daily rate of 2,330 tons. About 6% of the rock was hand-picked, as waste material, before it entered the mill. Production showed an increase of 9% over the quantity extracted in the preceding year.

The ore is supplied by the underground stoping of Blocks 2, 3, 4, 5 and 6 above the 600-foot level, where mining is carried out by the block caving system.

Drifts were advanced on Blocks 6 and 7 above the 600- and 700-foot levels and consisted of blasting of the base of the blocks, excavation, and timbering of haulage drifts.

In 1964 extraction was done in underground workings above the 600-foot level, in Blocks 4, 5, 6 and 8. Drifting was done in Blocks 7 and 8 and consisted in cutting the base of blocks, excavation and timbering of hauling drifts.

The quantity of ore extracted during 1964 was 747,000 tons, treated at a daily average of 2,862 tons, after elimination by sorting of 6% of rock of no commercial value.

The manager was Geo. W. Smith.

BLACKBURN BROS. LIMITED, Hull Township, Gatineau

Production: mica

Mining operations in the underground stopes of the mine located near Cantley were suspended on January 18, 1963.

The crusher was supplied from the reserves stockpiled on surface. The mill produced about 500 tons of crushed mica during the year under review.

P. Lawlor was the foreman of the mine. There were, on the average, five men employed at the property during 1963.

During 1964 the mine produced 70 tons of mica extracted from the underground workings of the Holt vein at the 100-foot level.

The mine was closed on November 13, 1964.

BROUGHTON SOAPSTONE AND QUARRIES COMPANY LIMITED, Leeds Township, Mégantic

Open-pit mining: soapstone, talc

Broughton Soapstone and Quarries Company Limited operated a pulverizing mill, located in Leeds township, and had a quarry in each of the townships of Leeds, Broughton and Thetford. The quarries in the two last townships were in operation in the years 1963 and 1964.

The quantity of rock extracted amounted to about 17,000 tons a year, of which 25% was sold in the form of blocks and pencils and the remainder was powdered and bagged.

The manager was Benoit Cyr.

CANADIAN JOHNS-MANVILLE COMPANY LTD., Shipton Township, Richmond

Production: asbestos

Canadian Johns-Manville Co., Ltd., mines an asbestos deposit and operates a fiberizing mill with a daily capacity of 20,000 tons.

Mining is done in a 450-foot-deep open-pit. The ore and steriles are hoisted to the surface by means of skips with a capacity of 40 tons at both east and west ends of the open-pit.

During the course of 1963, work carried out in view of installing the rolling skips for carrying the waste rock in the open-pit workings was continued. Excavation for the space necessary for the skips was completed. Building of the foundations of the railway and of loading chutes was continued.

The total amount of rock taken from the open-pit operations was 13,201,807 tons, of which 4,380,883 tons was processed in the fiberizing mill at a daily milling rate of 16,087 tons. Moreover, 554,023 tons of overburden was removed in order to make room for the extension of the open-pit at depth.

Extraction of the rock was carried out on the benches at elevations of 265, 300, 335, 370, 405, 440, 475, 505, and 540 feet above sealevel.

Activity in the underground workings, which consisted in the recuperation of serviceable material, was brought to a complete standstill during the summer.

During 1964 the total quantity of rock extracted was 15,166,696 tons, 8,952,382 tons of which constituted ore. A total of 5,061,148 tons of ore was treated at the plant with a daily average of 17,000 tons, after elimination by the sorting of 3,981,234 tons, representing 43% of rock of no commercial value.

Moreover 132,082 tons of overburden was stripped to allow extension of the open-pit.

Skips used for transporting steriles were introduced in February, 1964.

The manager was J.O. Eby.

CANADIAN REFRACTORIES LIMITED, Grenville and Harrington Townships, Argenteuil

Production: magnesitic dolomite

The quantity of ore drawn from underground stopes amounted to about 110,000 tons for an average of 480 tons a day in 1963. All the ore extracted came from the stopes serviced by the No. 2 shaft. The following stopes were exploited: 4300, 4295, 8320.

On April 26 of the year reviewed, a blasting operation was carried out at the No. 2 mine whereby 150,000 tons of ore was broken in a single blast. The ore taken from this central pillar after the blasting was the main source of supply in 1963.

Work preparatory to the removal of pillars was carried out during the year reviewed in the stopes designated as 8300, 8310 and 8295.

There were 108 persons employed at the mine in 1963.

During 1964 the plant treated daily an average of 450 tons of ore.

All this ore came from stopes serviced by the No. 2 shaft. Only two stopes were operated during 1964: Nos. 433 and 833.

Development work included mainly the preparation of stopes Nos. 8280, 8285, 8295, and 8310.

No production of asbestos was reported for the plant installed two years previously.

W. Bray was manager of the mine.

CANADIAN SILICA CORPORATION, Lac des Deux-Montagnes Seigniory,
Deux-Montagnes

Producer: sand and silica flour

Production in the quarry of Canadian Silica Corporation was 700 tons of crude stone a day on the average.

In 1964 production was, on the average, 1,000 tons of crude stone.

The manager was B.C. Fillingham.

CAREY CANADIAN MINES LIMITED, Broughton Township,Beauce

Producer: asbestos

Carey Canadian Mines Limited mines an asbestos deposit on lot 143, range III, Broughton township,and operates a fiberizing mill with a daily capacity of 3,000 tons. Mining is done in an open-pit about 150 feet deep.

During the course of 1963, the total amount of rock extracted from the open-pit operation was 2,028,800 tons. Out of this total, 950,900 tons was ore, which was treated in the fiberizing mill at the average daily rate of 3,000 tons. This tonnage is an increase of 6% over that of the preceding year.

Mining took place on the benches at the 1,155-, 1,200- and 1,245-foot elevations above sealevel at the site of the "C" deposit. The ratio of ore to waste rock is as 1 : 1.1.

Rock stripping on both the east and west sides of the open-pit involved the removal of 2,700,200 tons of overburden to allow the extension of the workings.

During 1964 work was done on benches at the 1,155-, 1,200-, and 1,245-foot elevations above sealevel.

The total quantity of rock extracted was 2,337,000 tons, 1,064,000 tons of which was ore treated at a daily average of 3,300 tons, representing an increase of 10% over the quantity treated during the previous year.

As was the case in 1963, the proportion of ore and sterile rock was 1: 1.1. A total of 2,104,000 tons of overburden was stripped on the west and east sides of the deposit to allow an extension in depth of the open-pit.

The manager was E.A. Boadway.

DOMINION INDUSTRIAL MINERAL CORPORATION, Lussier Township, Montcalm

Producer: crushed silica

Work at the quarry of Dominion Industrial Mineral Corporation was greatly slowed down because new installations were carried out during the year. The quarry was to be reopened in 1964.

In 1963 the manager was George P. Blix.

In 1964 extraction was resumed and about 92,700 tons containing about 60% first class silica and 40% second-class silica was shipped from Saint-Donat.

The company was reorganized during the year.

In 1964 the production manager was J.C. Walker.

DOMINION LIME LIMITED, Dudswell Township, Wolfe

Production: limestone

Dominion Lime Limited operates an open-pit where limestone is extracted and a crushing and screening plant to produce crushed stone used in concrete and in construction, a pulverizing plant for the preparation of agricultural lime and a plant for the production of quicklime in range VIII, Dudswell township.

During 1963, Dominion Lime Limited extracted from its open-pit operation a total of 200,000 tons of limestone. About 100,000 tons was used in the production of lime and the remainder was prepared to be used as crushed limestone.

In 1964 the quantity of rock extracted was 301,000 tons, 21% or 62,500 tons of which was prepared and crushed, 34% or 102,000 tons was transformed into agricultural lime and 45% or 136,500 tons was transformed into quicklime.

The manager was Peter Conway.

FLINTKOTE MINES LIMITED, Thetford Township, Mégantic

Production: asbestos

Flintkote Mines Limited mines asbestos in an open-pit on lots 18A, 18B and 19, range IV, Thetford township,and operates a fiberizing mill having a daily capacity of 2,000 tons.

Ore is hoisted to the surface from a depth of 300 feet by means of skips installed at the east end of the open-pit.

During the course of the year 1963, the quantity of rock extracted from open-pit workings by Flintkote Mines Limited totalled 1,306,546 tons, which was slightly less than the amount drawn during the preceding year. This work was carried out on lots 18 and 19, range IV, Thetford township. This latter lot, from which about 10% of the total quantity extracted was derived, is the property of Asbestos Corporation Limited.

The amount of ore treated in the fiberizing mill was 548,018 tons for an average daily rate of 2,000 tons. The tonnage processed represents an increase of 5% over that of the preceding year.

The ratio of ore to waste rock is 1 : 1.4.

The total quantity of rock extracted during 1964 was 1,334,300 tons, 530,122 tons of which was made up of ore that was treated at a daily rate of 2,000 tons.

The manager was F.P. Hodgson.

ILE-AUX-COUDRES PEAT MOSS, La Baleine Township. Charlevoix

Production: peat

Production, over a period of seven months, was about 225,000 cubic feet for the year 1964.

The managers were Lionel and Claude Dufour.

INDUSTRIAL FILLERS LIMITED, Stanbridge Township, Missisquoi

Quarry: marble

The firm Industrial Fillers Limited worked a marble quarry through a contractor. The quarry is situated on lot 23, Saint-Armand West, Stanbridge township.

The extracted rock is transported to the company's plant in Montreal.

Annual production of marble for 1963 and 1964 amounted to 14,000 tons.

The manager of this quarry was Peter Prescesky.

INTERNATIONAL MINERALS AND CHEMICAL CORPORATION, Buckingham and Derry
Townships, Papineau

Production: potassic feldspar, quartz

The mill of International Minerals and Chemical Corporation at Buckingham treated 600 tons of feldspar a month on the average, during 1963. Moreover, a total of 150 tons of quartz a month was brought to the mill and shipped without treatment.

The ore was derived from the quasi-underground operation of the Back mine located in Derry township, about 17 miles from Buckingham.

In 1964 the plant treated 8,164 tons of potassic feldspar. About 1,700 tons of crude quartz was also sold.

The main provider to the plant was the Back mine operated by the company in Derry township. This mine produced 6,000 tons of feldspar and practically all of the quartz.

Other contributors were Frank Charette, 1,623 tons; Régis Lachaine, 350 tons; Fernand Hébert, 281 tons; W. Donaldson, 262 tons; and V. Bigelow, 54 tons. All these quarries are in Derry and Buckingham townships.

Lionel Joyce was superintendent of the plant and N. Neilson was foreman at the Back mine.

JOHNSON'S ASBESTOS COMPANY Coleraine, Township, Mégantic

Open-pit mining: asbestos

During the year 1963, the quantity of ore treated at the fiberizing mill of Johnson's Asbestos Company Limited totalled 1,041,240 tons at an average daily rate of 3,705 tons. The amount of waste rock removed was 2,268,920 tons. This came from a total of 3,310,160 tons of rock extracted. The ratio of ore to waste material is 1: 2.2.

The ore was extracted from the open-pit operation on the benches at elevations of 1,000 and 1,100 feet above sealevel.

The mine manager was L. Lavigne.

JOHNSON'S COMPANY LIMITED, Thetford Township, Mégantic

Production: asbestos

During the course of the year 1963, the quantity of ore processed in the fiberizing mill of Johnson's Company Limited amounted to 529,100 tons at an average daily rate of 2,416 tons.

The ore was supplied by the mining of underground stopes and from the mining of the open-pit on lot 461.

The quantity of ore extracted by the block caving method of the underground stopes in Blocks 11 and 18 above the 1,100-foot elevation amounted to 342,314 tons and was 65% of the total tonnage mined.

Digging was carried out in blocks 12 and 17. This work consisted in the cutting of the base of the blocks and in the timbering of the development drifts.

In the open-pit operation, mining is carried out on the first three benches. The quantity of rock extracted amounted to 382,319 tons, of which 186,786 tons was ore. This tonnage represents 35% of the total mined. The ratio of ore to waste rock is as 1:1.

The manager of this mine was J.M. Cunningham.

LAKE ASBESTOS OF QUEBEC LIMITED, Ireland Township, Megantic

Production: asbestos

This company mines an asbestos deposit and operates a fiberizing mill with a daily capacity of 6,000 tons situated on lots 27 and 28, range V, Ireland township.

Mining is done in a 350-foot-deep open-pit.

During 1963, Lake Asbestos of Quebec Limited mined a total of 9,417,539 tons of rock, of which 1,912,462 tons was ore. This material was treated in the fiberizing mill at an average daily rate of 7,907 tons. The tonnage of rock drawn exceeded that of the preceding year by 21%, whereas the quantity of ore processed diminished by 11%.

The ore was supplied by extraction in the open-pit workings at the site of the deposits "A" and "C" on the benches of the 290-, 350-, 390-, 430-, 470-, 510-, 550- and 590-foot elevations, above sealevel.

Moreover, a total of 400,000 tons of overburden was removed in order to expose the rock surface.

During 1964 the total quantity of rock extracted was 10,636,506 tons, 2,169,181 tons of which was made up of ore which was treated at the plant at a daily average of 8,000 tons. The quantity treated increased 13.5% over the preceding year.

Moreover, a total of 1,042,492 tons of overburden was stripped to allow the extension of the open-pit.

The manager was Lionel Piuze.

LES CARRIÈRES LANGLOIS LIMITÉE, St. Marc-des-Carrières (St. Alban cadaster)
Portneuf

Producer: agricultural lime

Production by Les Carrières Langlois Ltée amounted to 500 tons of agricultural lime a day, on the average, during about seven months. Working of the quarry was recommenced in March 1963 because Domtar of St-Marc-des-Carrières was closed and it became impossible to purchase the stone.

During 1964 the daily production averaged 500 tons of crushed stone, corresponding to 500 tons a day of agricultural lime.

The manager was Maurice Langlois.

J.J. LECLERC ET FILS LIMITÉE, Nouvelle Township, Bonaventure

Quarry: limestone

The firm of J.J. Leclerc et Fils Limitée worked a limestone quarry situated on lot 20, range I, Nouvelle township, and operated a crushing and screening plant having a capacity of 1,000 tons a day.

The quantity of rock mined during the course of the year 1963 amounted to 50,000 tons, of which 20,000 tons was sold as agricultural lime and the remainder was shipped to paper manufacturers of the region.

A small quantity was sold as crushed stone for concrete and for construction.

The quantity of rock extracted in 1964 was 20,000 tons, most of which was sold as agricultural lime. The remainder was crushed to be used in concrete and in construction.

The manager is J.J. Leclerc.

TOURBIÈRE LECLERC PEAT MOSS, La Baleine Township, Charlevoix

Producer: peat

The production of peat in 1963 by Tourbière Leclerc Peat Moss totalled about 2,000 tons during seven months.

The manager of this enterprise was Laurent Leclerc.

LES AMENDEMENTS CALCAIRES DE LA RIVIÈRE BLEUE ENRG. Cabano Township,
Témiscouata

Quarry: limestone

Les Amendements Calcaires de la Rivière Bleue Enrg. worked a limestone quarry and operated a crushing and pulverizing mill in Cabano township.

Production at this plant is about 200 tons a day. Most of the limestone is pulverized and sold as agricultural lime.

The manager of this concern was Leo Lavoie.

E. MONTPETIT ET FILS LIMITÉE, Melocheville Village, Beauharnois

Producer: quartzite

During 1963, E. Montpetit et Fils Limitée produced about 36,000 tons of crude stone.

During 1964, the production amounted to about 700 to 800 tons.

The manager of this enterprise was Jean-Paul Montpetit.

NATIONAL ASBESTOS MINES LIMITED, Thetford Township, Mégantic

Production: asbestos

This company mines an asbestos deposit and operates a fiberizing mill with a daily capacity of 3,000 tons on lot 15, range IV, Thetford township.

Mining is done in a 100-foot-deep open-pit.

In the open-pit workings extraction was carried out on the two benches at the 1,100- and 1,150-foot elevations above sealevel.

During 1963, the total quantity of rock extracted by National Asbestos Mines Limited from the open-pit operation amounted to 1,907,000 tons, of which 926,000 tons was treated at the fiberizing plant at an average daily rate of 3,080 tons. This tonnage represents an increase of 14% over the quantity treated during the preceding year.

In 1964, work was carried out at the 1,100- and 1,145-foot elevations above sealevel.

The quantity of rock extracted during 1964 attained 2,529,000 tons containing 992,000 tons of ore. A total of 937,500 tons was treated in the plant at a daily average of 3,000 tons, after sorting, which eliminated 6% of steriles, or 54,500 tons.

The manager was R.S. Coleman.

NICOLET ASBESTOS MINES LIMITED, Tingwick Township, Arthabaska

Production: asbestos

This company mines an asbestos deposit and operates a fiberizing mill with a daily capacity of 2,000 tons on lots 20 and 21, range XI, Tingwick township.

Extraction is carried out in an open-pit having a depth of 150 feet.

The quantity of rock extracted by Nicolet Asbestos Mines Limited during the course of the year 1963 totalled 541,454 tons, of which total 426,334 tons was treated in the fiberizing mill at an average daily rate of 1,800 tons. This production is a 12% decrease as compared with the quantity treated during the preceding year. Extraction was carried out on the 1st, 3rd, and 4th benches.

The quantity of rock extracted during 1964 was 656,450 tons containing 506,450 tons of ore. A total of 464,818 tons was treated in the mill at a daily rate of 1,600 tons after sorting, which eliminated 41,632 tons or 9% of rock of no commercial value.

The manager was Léon Montpetit.

PORT DANIEL QUARRY, Port-Daniel Township, Bonaventure

Quarry: limestone

The quarry of Port-Daniel is mined by Gaspesia Sulfite Company Limited, of Chandler.

The crushed limestone is transported by freight-train to Chandler where it is used in the manufacture of paper.

For 1963 and 1964 the annual production of Port Daniel Quarry was 12,000 tons of crushed limestone.

The manager of this enterprise was Owen Brimble.

QUEBEC CLAY MINING LIMITED, Chateau Richer Parish, Montmorency

Producer: kaolinite (anorthite)

Operations by Quebec Clay Mining Limited were sporadic and depended on purchasing orders.

During the year 1963, the company sold about 300 tons for testing.

Guy Gilbert was the manager of this enterprise.

QUEBEC LITHIUM CORPORATION LIMITED, Lacorne Township, Abitibi-East

Production: lithium carbonate, monohydrated lithium hydroxide

The underground operations of Quebec Lithium Corporation Limited, which was active only from April to June inclusive, and during the months of November and December, in 1963, were responsible for the extraction of 65,100 tons of ore, which carried 1.55% lithium oxide. This ore yielded a total of 1,994,750 pounds of lithium carbonate and 254,416 pounds of lithium hydroxide.

The ore came from five stopes situated on the two development levels. One of these stopes, the 2V2E, is new. Most of the ore was derived from the 1V2E and 2V1E stopes.

There was no diamond drilling or lateral development work carried out from below surface. Digging of a raise, for ventilation and service, was carried out, however, to the east of the stope known as 1S2E.

The new process of producing lithium carbonate and lithium hydroxide in the refinery is being continually developed.

The total number of employees at this mine varied from 156 to 94, according as underground operations were active or inactive during the year reviewed.

The mine had as its manager R. Plasse.

During 1964 underground mining was carried out from April to June inclusively and during November and December; 55,110 tons of ore was extracted, averaging about 1.4% lithium oxide. The refinery produced 2,335,550 pounds of lithium carbonate and 840,939 pounds of lithium carbonate hydroxide.

Ore was broken and hauled from two stopes at the 150-foot level and from two stopes at the 275-foot level. At the latter level, ore was also hauled from two other stopes. All these stopes are operated by the shrinkage-stoping method.

No diamond drilling or driving of drifts was done. However, an access and ventilation raise was driven for the 2V2E stope at the 275-foot level.

At the refinery, changes and additions were continued with the aim of improving and increasing the production of lithium by-products. For this purpose the enlargement of the installation for the production of lithium carbonate was started.

Reserves of broken ore and of ore ready for extraction are maintained at about one million tons.

When underground operations are carried on, the total number of employees at this mine is about 168.

Towards the end of 1964, the manager was R. Lavertu who assumed charge following the departure of R. Plasse.

SAGUENAY PEAT MOSS CO. LTD., Rang St-Jean-Baptiste, Bagotville, Chicoutimi

Production: peat

Production varied from 20 to 25 tons a day. The manager was Bertrand Gagnon.

SAGUENAY PEAT MOSS CO. LTD., Ile-aux-Coudres, Rang de la Baleine, Charlevoix

Production: peat

Production for 1964 was about 92,000 cubic feet. The manager was Bertrand Gagnon.

ST-MARC PEAT MOSS INC., Alton Township, Portneuf

During 1964, 7,500 cubic yards of peat was extracted and dried to be sold during 1965. The manager was Antoine Bussières.

SHAWINIGAN CHEMICALS LIMITED, Stanbridge Township, Missisquoi

Quarry: limestone

Shawinigan Chemicals Limited worked a limestone quarry and operated a crushing and screening plant having a 400-ton-an-hour capacity, a plant for the preparation of agricultural lime and a combined dryer and dust collecting plant, on lots 7 and 8, range VIII, Stanbridge township.

Production of this quarry was 330,000 tons during the course of the year 1963. The quantity of agricultural lime produced totalled 28,000 tons. A limited amount of limestone was treated in the pulverizing mill and the collected dust was sold as filler. The remainder of the rock was shipped to the company's plant at Shawinigan.

Production during 1964 attained about 300,000 tons, approximately 10% of which was sold as agricultural lime. A limited quantity is treated in the dust recovery mill and sold as filling material. The remainder is shipped by freight to the company mill at Shawinigan.

The manager was Douglas McKim.

SHERWIN WILLIAMS COMPANY LIMITED, Saint-Malo Range, Champlain

Production: bog iron for pigments

Production by Sherwin Williams Company Limited in 1963 amounted to approximately 900 tons of crude ore. The company is still using its reserves.

J. Bradley was the manager of this enterprise.

SICOTTE ET FILS LIMITÉE, ARMAND, Howick Parish, Châteauguay

Production: crushed silica

Production by Armand Sicotte et Fils Limitée during 1963 and 1964 amounted to 800 tons of crushed silica a day, on the average, during about five months.

The manager of this company was Charles Gervais in 1963.

In 1964, the manager was Bernard Sicotte.

TOURBIÈRE LECLERC PEAT MOSS, La Baleine Township, Charlevoix

Production: peat

Total production for 1963 was about 2,000 tons during seven months.

During 1964, total production was about 4,000 tons during seven months.

The manager was Laurent Leclerc.

TOURBIÈRE SAGUENAY LTÉE, Les Escoumins, Saguenay

Production: peat

Production during 1964 was about 400,000 cubic feet of peat.

The manager was Emmanuel Roy.

UNION CARBIDE CANADA LIMITED, St-Clément, Beauharnois

Production: quartzite

The quarry was not worked during 1963, the company using its reserves. The manager was A. I. Hainey. Interrupted since 1962, operations in the quarry were resumed on April 20, 1964. Production was about 1,300 tons a day.

The superintendent was G. Longwell.

PRODUCERS OF BUILDING MATERIALS

Producers of building materials are listed below along with information related to their activity during 1963 and 1964.

Table 45 - Producers of Building Materials, 1963-1964

Abbreviations:

Cty.: County
Cu. ft.: Cubic feet
D.: Day
Par.: Parish
S.: Stone
T.: Ton
Tp.: Township
Twn.: Town
V.: Village

Name of producer	Locality	Nature of product	Remarks
Carrière d'Acton Vale Ltée	Acton Tp., Bagot Cty.	Limestone	About 1/3 of this production goes for preparation of agricultural lime. The remainder is used for concrete and for construction.
Adru Granite Inc.	Tp. of Stanstead, Lot 401, range VI.	Granite	Building and monument construction.
Airmat Corp. Ltd.	Bouchette Tp., Gatineau Cty.	Dolomite and crystalline limestone	From May to the end of October 1964.
Amendements Calcaires de Rivière Bleue Enrg. (Les)	Cabano Tp.	Limestone	
Carrière Andorno Quarry	Cap-St-Martin, Laval Cty.	Limestone for construction	
Carrières d'Argenteuil et Deux-Montagnes Inc. (Les)	St-André East, Argenteuil Cty.	Granite	
Back River Quarries Ltd.	Chomedey	Limestone	
Baillargeon, Philippe	Laprairie Twn.	Schist	
Jean Bédard Ltée	Caughnawaga, Laprairie Cty.	Crushed limestone	
Beebe Granite Works, Ltd.	Stanstead, Stanstead Tp.	Granite	On lot 362A. Stone cutting shop at Beebe. Construction and monument stone.
" " "	Milot Tp., Lac-St-Jean Cty.	Granite	Manager, Alphège Beaudin. Stone is shipped to Beebe shops.
Carrière Bernier Ltée	St-Jean Par., St-Jean Cty.	Crushed limestone	In Petit-Bernier Range.

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Table 45 - Producers of Building Materials, 1963-1964 (Cont.)

Name of producer	Locality	Nature of product	Remarks
Bérubé, Lucien	Petites Bergeronnes Tp., Saguenay Cty.	Granite	
Billet Ltée, A	Bélanger Tp., Laval Cty.	Crushed limestone	
Bomar Contractors Ltd. (anc. carrière Cap St-Martin Ltée)	Cap-St-Martin, Laval Cty.	Crushed Limestone	
Brodies Ltd.	Campbell Tp., Labelle Cty.	Granite for construction	
" "	Stanstead Tp., Stanstead Cty.	Granite	The quarry is situated on lot 161 Range VI. Most of the broken stone is shipped to the United States and to the cutting stone shops of Brodies Ltd. at Montreal and of Stanstead Granite at Beebe.
" "	Mount Johnson, Iberville Cty.	Granite	This company is the ownership of Rock of Ages, of Barre, Vermont, U.S.A.
Granit Bussières Inc.	Whitton Tp., Frontenac Cty.	Granite	The shop is situated in Range IV Whitton Tp. Stone is extracted from two quarries, one of which is on lot 5 Range 9, Gayhurst Tp. and the other in Stanstead township.
Les Calcites du Nord Inc.	Mistassini, Roberval Cty.	Calcite	About 100T. a day of crude stone are shipped to neighbouring paper mills.
Canada Cement Co. Ltd.	Montreal-East, Laval Cty.	Limestone for cement	Crushed stone.
Canada Cement Co. Ltd.	Hull Tp., Gatineau Cty.	Limestone for cement	Also produces daily 250T. of clay.
Canadian Pink Granite Ltd.	Campbell Tp., Labelle Cty.	Granite for construction	
Caron & Théberge Ltée	St-Grégoire, Iberville Cty.	Granite	
L. Charbonneau & Cie	St-François, Laval Cty.	Limestone for construction	

Table 45 - Producers of Building Materials, 1963-1964 (Cont.)

Name of producer	Locality	Nature of product	Remarks
Carrière Charlesbourg Ltée	Charlesbourg-East, Quebec Cty.	Limestone	Crushed stone mixed with sand (about 1/3). In 1965, operations were done by Komo Construction under contract.
Central Paving & Excavation Ltd.	Templeton Tp., Papineau Cty.	Limestone	Operated since October, 1964. Crushed stone.
Charlebois, Gérard	Marchand Tp.	Granite	
Ciment Québec Inc.	D'Auteuil Seigniory, Portneuf Cty.	Crushed limestone	
Cie de Construction des Boulevards du Québec	Bourg-Royal and Valcartier	Crushed gravel	The Bourg-Royal quarry was not opened in 1964.
Compagnie Granite Eternité Ltée (La)	Stratford Tp.	Granite	
Concreters Ready-Mix Ltd.	St-Regis Tp., Laprairie Cty.	Crushed limestone	After an interruption of operations caused by the bankruptcy of St-Régis Paving & Supply Reg., production was resumed in May.
Carrière Côteau-du-Lac Inc.	St-Ignace, Vaudreuil-Soulanges Cty.	Crushed limestone	
De-Mix Inc.	Mount St-Hilaire, Rouville Cty.	Limestone	Quarry and crushing and screening plant with an hourly capacity of 400T. For concrete and construction.
Construction Deschênes Ltée	Hull Tp., Gatineau Cty.	Crushed limestone	In 1963 the quarry employed 26 persons.
Dominion Lime Ltd.	Dudswell Tp.	Limestone	
Domtar Chemicals Ltd.	St-Pierre and Ste-Emilie, Joliette Cty.	Crushed limestone	
Dontigny, Yvon	Ste-Thècle, Champlain Cty.	Marble	
Carrières Ducharme et St-Onge Enrg.	Havelock Tp., Huntingdon Cty.	Sandstone	Operations were started in April 1964. Slabs are sold as façade stone and for patio flooring.
Carrière Dulude Ltée	St-Bruno, range XXV, Chambly Cty.	Crushed siliceous limestone	

Table 45 - Producers of Building Materials, 1963-1964 (Cont.)

Name of producer	Locality	Nature of product	Remarks
Dumas & Voyer Ltée	Bois Tp., Portneuf Cty.	Granite for construction	
Carrière Du Pont Ltée	St-Nicholas, Lévis Cty.	Sandstone	Crushing and screening plant with a daily capacity of 200T. New machinery and improvements to the plant during 1963. Crushed and screened stone is used in the preparation of concrete and in construction.
Entreprise Beaudry Ltée	Duvernay, Laval Cty.	Crushed limestone	
Frontenac Paving Ltd.	Stanfold Tp., Arthabaska Cty. Ste-Foy, Quebec Cty.	Sandstone	From May to September 1963, operated a sandstone quarry and a portable crushing and screening plant with an hourly capacity of 200T.
Gaboriault & Nevers Reg'd.	Grenville Tp., Argenteuil Cty.	Granite	Monument and construction stone.
Gagnon, L.-P. Ltée	St-David, Lévis Cty.	Sandstone	Sandstone used in preparation of concrete and in construction.
Gaspesia Pulp & Paper Co. Ltd.	Port-Daniel Tp.	Limestone	
Gauthier, J.-O. Ltée	St-Marc-des-Carrières, Portneuf Cty.	Calcareous fertilizer, cut stone and stone for paper mills.	
Carrières Gouin Ltée	St-Alban Par., Portneuf Cty.	Limestone	
Carrière Goyer (Division of Dominion Lime Ltd.)	St-Bruno, Chambly Cty.	Crushed siliceous limestone	Limestone situated in Range XXII.
G.L.M. Granit Ltée	Gayhurst Tp., Frontenac Cty.	Granite	Acquired in 1963 the property of the Everlasting Granite Company Ltd. Monument and construction stone.
Granit National Ltée	Garnier Tp., Lac St-Jean Cty.	Granite for construction	The Chute-du-Diable quarry produced weekly 150T shipped by truck to the St-Gédéon plant. The Ste-Anne de Chicoutimi quarry produced 500T of blocks for construction and the Ile d'Alma quarry furnished 100T a week during three months.

Table 45 - Producers of Building Materials, 1963-1964 (Cont.)

Name of producer	Locality	Nature of product	Remarks
Carrière Elie Grenier Enrg.	Shawinigan Tp.	Crushed granite and slabs	Produced sporadically small quantities of crushed stone (20T a day).
Haselton Granite Quarries (The)	Stanstead Tp., Stanstead Cty.	Granite	Quarry and dressing plant on lots 24 and 25, Range VI. For construction and monuments.
Carrière Hébert Inc.	Ascot Tp., Sherbrooke Cty.	Crushed stone	Quarry and plant situated on part of lot 6B Range X. Stone used for concrete and for construction.
Highway Paving Co. Ltd. (The)	St-Michel Town, Laval Cty.	Crushed limestone	In 1964 produced over 6,000,000T.
Industrial Fillers Ltd.	St-Armand, Missisquoi Cty.	Marble	
Janal Inc.	Duhamel Tp.	Granite	
Jean & Frères Enrg.	Montauban Tp.	Granite	
Joliette Asphalte Ltée	St-Jacques, Joliette Cty.	Crushed limestone	
Carrière Joliette Ltée	Ste-Thérèse, Joliette Cty.	Crushed limestone	Quarry closed during the winter season.
Les Carrières Lagacé Ltée	L'Abord-à-Plouffe, Laval Cty.	Crushed limestone	Lagacé quarry at St-Martin, 4,000T a day.
Les Carrières Langlois & Frères Enrg.	Stukely Tp., Shefford Cty.	Marble	Succeeded to South-Stukely Marble and Terrazzo Co. Ltd. Installations on lot 274, Stukely township. During the fall a new plant with a daily capacity of 2,000T was installed. Operations were suspended in July, 1964.
Langlois, J.M.	Laprairie Twn.	Schist	
Carrières Langlois Ltée	St-Alban Par., Portneuf Cty.	Limestone	
Hector Laroche	Bois Tp., Portneuf Cty.	Granite for construction	Sidewalk chains.
Laurentian Dolomite Mining Ltd.	Campbell Tp., Labelle Cty.	Dolomitic limestone	Operations which started on the first of August, 1964, were discontinued during winter.

Table 45 - Producers of Building Materials, 1963-1964 (Cont.)

Name of producer	Locality	Nature of product	Remarks
Les Carrières Laurentiennes Inc.	St-Antoine, Terrebonne Cty.	Crushed limestone	Quarry closed since December 15, 1964.
Lavoie, Jean-Marc	De l'Ile Tp.	Granite	
J.J. Leclerc & Fils Ltée	Nouvelle Tp.	Limestone	
Carrière Marchand Ltée	Ste-Flore Par., St-Maurice Cty.	Granite	
Carrière Marchand Ltée	Shawinigan-North	Biotite gneiss	
Les carrières Martineau & Deschambault Inc.	St-Marc-des-Carrières, Portneuf Cty.	Crushed limestone, cut stone and granite	
" " "	Stratford Tp., Wolfe Cty.	Granite	Gray granite quarry on lot 22 Range VII and dressing shop at St-Gérard, Wolfe Cty. For construction and monuments.
Masson, Rhéal	Aylmer-East	Limestone	
Melrose Granite Co.	Mount Johnson, Iberville Cty.	Granite	Blue granite quarry on Mount Johnson. Properties acquired from Louis Mercier during 1964. Operations suspended in September.
" " "	Campbell Tp., Labelle Cty.	Granite for construction	
Méthé Frères Ltée	Stanbridge Tp., Missisquoi Cty.	Limestone	20% sold as agricultural lime. The remainder is used in concrete and in construction. Two quarries on lots 211 and 214 Range IX. Crushing and screening shop with daily capacity of 1,000T and a plant for the preparation of agricultural lime in Stanbridge Tp.
Compagnie Miron Ltée	St-Michel, Laval Cty.	Crushed limestone	
Missisquoi Marble and Stone Corp.	Philipsburg, Missisquoi Cty.	Marble	
Modern Paving and Construction Ltd.	Stanford Tp., Arthabaska Cty.	Sandstone	Quarry and portable crushing and screening plant with an hourly capacity of 150T. Products used in concrete and in construction.

Table 45 - Producers of Building Materials, 1963-1964 (Cont.)

Name of producer	Locality	Nature of product	Remarks
Modern Quarries Inc.	Simpson Tp., Drummond Cty.	Limestone	Quarry and crushing and screening plant with an hourly capacity of 300T in Range V.
Carrières Montmagny Inc.	Cap St-Ignace, Montmagny Cty.	Crushed sandstone	Since July, 1963, operates a quarry and a crushing and screening plant with an hourly capacity of 100T.
Carrières Montmartre Inc.	St-Alexis, Montcalm Cty.	Limestone	
Carrière Montréal-Est Ltée	Montréal-East, Laval Cty.	Crushed limestone	
Les Carrières Normont Ltée	Bélanger Tp., Laval Cty.	Crushed limestone	
Notre-Dame Quarries Co. Ltd.	Simpson Tp., Drummond Cty.	Sandstone	Quarry and crushing and screening plant with an hourly capacity of 150T on lots 1 and 2, Range XI. About 10% is prepared in granules and bagged . The remainder is used for concrete and for construction.
Orford Marble Co. Ltd.	Orford Tp., Sherbrooke Cty.	Marble	Installations on lots 10, 11 and 12 Range F. About 1,000T sold in blocks for construction and ornamentation, The remainder is used for terrazzo.
Pavage Frontenac Ltée	Ste-Foy, Quebec Cty.	Limestone	
Perron & Frères Enrg., J.B.A.	Bois Tp., Portneuf Cty.	Granite	For curbstone.
Pic Construction Co. Ltée	Simard Tp., Chicoutimi Cty.	Limestone	
Plouffe, Eugène	Campbell Tp.	Granite	
Plourde & Plourde Ltée	Tremblay Tp., Chicoutimi Cty.	Crushed limestone	
Carrière Pointe-Claire Inc.	Kirkland, Jacques Cartier Cty.	Crushed limestone	
Polycarpe Moreau Inc.	Taillon Tp., Lac-St-Jean Cty.	Granite for construction	Crude stone is shipped by truck to the dressing shop at Hébertville-Station.

Table 45 - Producers of Building Materials, 1963-1964 (Cont.)

Name of producer	Locality	Nature of product	Remarks
Poudrette, Richard	Mount St-Hilaire, Rouville Cty.	Crushed stone	Crushing and screening plant with a daily capacity of 500T for concrete and for construction.
Quebec Ready-Mix Inc.	Charlesbourg-West, Quebec Cty.	Crushed limestone	Produces daily 800T of quarry gravel. Intermittent operations.
Regional Construction Co.	St-Louis de Gonzague Tp., Beauharnois Cty.	Crushed limestone	
Les Carrières Rimouski Inc.	Nicholas Rioux seigniory, Rimouski Cty.	Sandstone	For concrete and for construction. Following an agreement with Les Mines Roy & Ross Inc., operates a quarry on the latter's property as well as a crushing and screening plant with a daily capacity of 50T.
Rioux & Frères	Dunham Tp., Missisquoi Cty.	Limestone	Quarry and crushing and screening plant with an hourly capacity of 300T on lots 281 and 285. For concrete and for construction.
Rivermont Construction Co. Ltd.	Caughnawaga, Laprairie Cty.	Crushed limestone	
Carrières de Roberval Ltée	Roberval Tp., Roberval Cty.	Crushed limestone	
Carrières Rouville Inc.	St-Hilaire, Rouville Cty.	Siliceous limestone	
Roy & Trottier Inc.	St-Louis-de-France, Champlain Cty.	Crushed limestone	
Les Carrières de St-Armand Ltée	Stanbridge Tp., Missisquoi Cty.	Marble	Quarry and crushing and screening plant in St-Henri Range. About 85% is used in terrazzo and the remainder is sold as agricultural lime.
Carrière St-Barthélémy Ltée	Du Sablé Tp., Berthier Cty.	Crushed limestone	In 1964 also operated a quarry at Bayonne-Sud.
Carrières St-Chrysostome Inc. (Les)	Havelock Tp.	Sandstone	
Les Carrières de St-Dominique Ltée	St-Dominique, Bagot Cty.	Limestone	Operates two quarries and two crushing and screening plants in St-Dominique Range. 50% of the production is sold as agricultural lime. The remainder is used for concrete and for construction.

Table 45 - Producers of Building Materials, 1963-1964 (Cont.)

Name of producer	Locality	Nature of product	Remarks
Carrières St-Eustache Ltée (Les)	St-Eustache, Deux-Montagnes Cty.	Crushed limestone	Was operated during 10 months in 1963.
Les Carrières de St-Ferdinand Inc.	Halifax Tp., Mégantic Cty.	Limestone	Crushing, screening and pulverizing plant with an hourly capacity of 100T on lots 248 and 249, Range VI. In operation since September. Products sold as agricultural lime.
La Carrière St-Flavien Inc.	St-Flavien, Lotbinière Cty.	Granite	Quarry and portable crushing and screening plant with an hourly capacity of 200T for concrete and for construction.
Carrière St-François Ltée	Grantham Tp., Drummond Cty.	Limestone	Quarry and portable crushing and screening plant with an hourly capacity of 200T on lot 431 Range VIII. For concrete and for construction.
La Cie des Ciments du St-Laurent	Villeneuve, Quebec Cty.	Crushed limestone	
Carrière St-Maurice Inc.	St-Louis de France, Champlain Cty.	Crushed limestone	
Carrières St-Paul Quarries Inc.	St-Paul d'Abbotsford, St-Pie de Bagot	Limestone	Quarry and portable crushing and screening shop with an hourly capacity of 300T. Another quarry about two miles distant from St-Pie was opened during the summer. Products are used for the preparation of concrete and for construction.
St-Régis Paving and Supplies Reg'd.	St-Regis Tp., Laprairie Cty.	Crushed limestone	
St-Samuel Granit Enrg.	Gayhurst Tp., Frontenac Cty.	Granite	Quarry and dressing plant, lot 1 Range VII. For construction and monuments.
Les Calcaires Salaberry Inc.	St-Jacques-le-Mineur, Laprairie Cty.	Crushed limestone	
J.-O. Sauvé	Hull Tp., Gatineau Cty.	Limestone	Product used in paper mills in Hull area.
Les Carrières de Granit Scotstown Ltée	Linwick Tp., Wolfe Cty.	Granite	Acquired properties of Scotstown Granite Co. Ltd. One quarry situated on lot 9 Range X was opened in September, 1963. The dressing plant is located at Cap-St-Martin.

Table 45 - Producers of Building Materials, 1963-1964 (Cont.)

Name of producer	Locality	Nature of product	Remarks
Shawinigan Chemicals Ltd.	Stanbridge Tp.	Limestone	
Carrière Shawinigan Ltée	Shawinigan Tp., St-Maurice Cty.	Crushed granite	
Armand Sicotte & Fils Ltée	Ste-Geneviève, Berthier Cty.	Limestone	
Silver Granite Industries Ltd.	Gayhurst Tp., Frontenac Cty.	Granite	Quarry and dressing plant with a daily capacity of 200 cu. ft. on lot 1 Range VIII. For construction and monuments.
Adjutor Simard Inc.	Pointe-au-Pic, Charlevoix Cty.	Siliceous limestone	Produces in addition about 500T a year of basement stone.
Stanstead Granite Ltd.	Stanstead Tp., Stanstead Cty.	Granite	Gray granite quarry on lots 54 to 58, Range VII.
Suzor, Ovila	St-Basile, Portneuf Cty.	Granite	
Tracy Construction Inc.	Fraserville, Riv.-du-Loup Cty.	Sandstone	
Carrières T.R.P. Ltée	Ste-Rosalie, Bagot Cty.	Limestone	
Carrières Unies Ltée	St-Jacques, Chambly Cty.	Limestone	During the summer of 1964, preparatory work was done and operations were inaugurated during the fall.
Union des Carrières & Pavages Ltée	Charlesbourg-Ouest, Québec Cty.	Crushed limestone	In addition produced intermittently during 1963 1,000T of gravel a day.
Union Construction Ltée	Longueuil barony, St-Jean Cty.	Crushed limestone	
United Stone Products Ltd.	Ste-Geneviève, Jacques-Cartier Cty.	Crushed limestone	
Carrière Universelle Ltée (1963)	Bulstrode Tp., Arthabaska Cty.	Limestone	Quarry and portable crushing and screening plant with an hourly capacity of 200T, on lot 23, Range VIII. In operation since August, 1963. For concrete and for construction.

Table 45 - Producers of Building Materials, 1963-1964 (Concluded)

Name of producer	Locality	Nature of product	Remarks
Carrières Varennes Ltée	Varennes, Verchères Cty.	Crushed gneiss	
Verreault Ltée, Elzéar	Giffard, Quebec Cty.	Crushed limestone	
Viau, Paul	Nouveau Salaberry de Valleyfield Tp., Beauharnois Cty.	Crushed limestone	
Walsh Quebec Construction Co. Ltd.	Laprairie Twn.	Schist	
Les Marbres Waterloo Ltée	Stukely Tp., Shefford Cty.	Marble	Acquired during 1964 the property of Waterloo Mines Ltd.
Waterloo Mines Inc.	Stukely Tp., Shefford Cty.	Marble	Products used for terrazzo.
White Diamond Granit Co. Ltd.	Stratford and Bois Tps.	Granite	

DRILLING, PRODUCTION AND RESERVES

Table 46 - Exploratory Diamond Drilling in Quebec in 1963 and 1964

(Locality means township except when otherwise stated;
symbols "I", "P", "T" signify island, parish
and territory.)

Locality	Mine	Number of feet	
		1963	1964
Abitibi (T)	Canadian Nickel Co. Ltd.	-	24,049
Abitibi (T) Mistassini(T)	Canadian Nickel Co, Ltd.	-	47,987
Aigremont	Muscocho Explorations Ltd.	-	583
Anticosti (I)	Lowlands Exploration Ltd.	12,814	-
Ascot	Sullico Mines Ltd.	-	3,967
Baby	Delhi Pacific Mines Ltd.	1,101	-
	Voyager Explorations Ltd.	1,000	-
Bacon	Kerr Addison Mines Ltd.	-	416
Barraute	Canadian Johns-Manville Co. Ltd.	1,105	3,887
Beauchastel	Beauchastel Syndicate	-	5,388
	Consolidated Zinc Corp. of Canada Ltd.	-	2,467
	Falconbridge Nickel Mines Ltd.	1,989	-
	Francoeur Mines Ltd.	1,701	6,032
	G.S. Eplett Mining Development Co. Ltd.	1,070	-
	Horne Fault Mines Ltd.	1,989	2,557
	Lenmac Mines Ltd.	1,513	-
	Newrich Explorations Ltd.	1,471	-
	Peel Elder Ltd.	860	827
	Wasamac Mines Ltd.	-	1,025
Benoit	Canadian Nickel Co. Ltd.	-	843
Blondeau	Conrego Nickel Mines Ltd.	-	3,332
	McIntyre Porcupine Mines Ltd.	614	2,828
Boisbuisson	Société d'Exploration et d'Exploitation minière Boisbuisson de Cap Chat	-	4,768
Bolton	Sullico Mines Ltd.	-	365
Bourbaux	Aqua Mining Corp. Ltd.	2,056	-
Bourlamaque	Frobex Ltd.	-	1,199
	Lamaque Mining Co. Ltd.	89,124	81,166
	Manitou Barvue Mines Ltd.	27,678	22,920
	Orenada Mines Ltd.	6,910	-
	Sigma Mines (Quebec) Ltd.	52,087	49,676
	Sullico Mines Ltd.	5,142	2,860
Bousquet	Kerr Addison Mines Ltd.	-	805
	Lamaque Exploration Co. Ltd.	-	845
	Mines Dumagami Ltée (Les)	16,608	17,099
	Norlex Mines Ltd.	2,042	-

Table 46 -Exploratory Diamond Drilling in Quebec in 1963 and 1964 (Cont'd.)

Locality	Mine	Number of feet	
		1963	1964
Bousquet	Sullico Mines Ltd.	-	504
	Supreme Mines Ltd.	-	496
Brassard	Superior Silica Mining Ltd.	-	3,102
Bristol	Hilton Mines Ltd.	28,476	-
Brome	Mandarin Mines Ltd.	-	681
Cadillac	Bankfield Consolidated Mines Ltd. ..	2,005	-
	Camador Mining Exploration Co. Ltd..	1,000	-
	Canadian Malartic Gold Mines Ltd. ..	-	654
	Dumont Nickel Corp.	-	3,269
	Kewagama Gold Mines (Quebec) Ltd. ..	-	889
	New Alger Mines Ltd.	1,407	-
Carpentier	Canadian Johns-Manville Co. Ltd. ...	-	5,702
	Canadian Nickel Co. Ltd..............	-	1,309
	Marimac Mines Ltd.	-	2,371
	Ryanor Mining Co. Ltd.	-	814
Castagnier	Dome Exploration Co. (Quebec) Ltd.	-	238
Cavelier	Watson Lake Mines Ltd.	2,297	-
Charlevoix (County)	Leeds Metals Co. Ltd.	-	150
Chavigny	Société d'Exploration Minière Tétreault-Trépanier	-	154
Clericy	Anaconda American Brass Ltd.	-	5,920
	United Obalski Mining Co. Ltd.	7,970	-
Clermont	Newbaska Gold and Copper Mines Ltd.	-	2,864
Coleraine	Asbestos Corporation Ltd............	-	4,096
	Aylmer Mines Ltd.	5,992	2,647
	Sullico Mines Ltd.	1,873	222
Comporté	Noranda Mines Ltd.	-	11,057
Courville	Big Town Copper Mines Ltd.	5,555	5,670
	Eastville Gold Mines Co. Ltd.	431	765
	Ellmergo Mining Co. Ltd.	-	5,087
	Pershing Manitou Gold Mines Ltd. ...	-	2,169
Cuvier	Kerr Addison Mines Ltd.	-	2,227
	Prospectors Airways Co. Ltd.	206	-
Daniel	Daering Explorers Corporation Ltd...	4,915	1,005
	Hydra Explorations Ltd.	-	421
	Lake McIvor Mines Ltd.	4,273	-
	New Hosco Mines Ltd.	15,375	19,273
	Noranda Mines Ltd.	-	886
	Trinity Chibougamau Mines Ltd.	-	1,406

Table 46 - Exploratory Diamond Drilling in Quebec in 1963 and 1964 (Cont'd.)

Locality	Mine	Number of feet	
		1963	1964
Dasserat	Croinor Pershing Mines Ltd.	1,074	-
	North Bordulac Mines Ltd.	22,098	-
	Odyno Exploration et Développement Ltée	-	78
	Payrock Mines Ltd....................	-	675
Decarie	Noranda Mines Ltd....................	-	532
De Sales	Lullwitz-Kaeppeli Mineral Exploration Partnership	40	-
Desandrouins	Mining Corporation of Canada Ltd. ...	1,328	-
Desjardins	Alcourt Mines Ltd.	1,000	-
Desmeloizes	Mining Corporation of Canada Ltd. ...	1,582	-
	New Metalore Mining Co. Ltd.	12,000	-
	Normetal Mining Corporation Ltd......	17,258	25,043
Des Musseaux	McIntyre Porcupine Mines Ltd.	1,039	-
	Paramaque Mines Ltd.	501	-
Destor	Mining Corporation of Canada Ltd.....	1,101	
	Odyno Exploration et Développement Ltée	-	119
Dolomieu	Nisto Mines Ltd.	-	543
Dubuisson	Bornite Mines Ltd.	4,973	-
	Con-Shawkey Gold Mines Ltd.	-	2,038
	Croinor Pershing Mines Ltd.	12,057	-
	Elmac Malartic Mines Ltd.	8,858	-
	Glacier Explorers Ltd.	3,222	-
	Kiena Gold Mines Ltd.	33,856	23,268
	Lancer Petroleums Ltd.	-	1,502
	Lencourt Gold Mines Ltd.	1,500	2,691
	Little Long Lac Gold Mines Ltd.	3,572	6,086
	Marban Gold Mines Ltd.	45,280	42,465
	Mines Dumagami Ltée (Les)	10,103	-
	Newlund Mines Ltd.	7,025	-
	Noranda Mines Ltd.	-	750
	Quebec Explorer Corporation Ltd.	-	3,007
Dufresnoy	Continental Copper Mines Ltd.	4,384	4,437
	Lake Dufault Mines Ltd.	60,128	49,949
	MacDonald Mines Ltd.	-	5,000
	Magoma Mines Ltd.	2,645	-
	New Insco Mines Ltd.	5,067	-
	Noranda Mines Ltd.	-	314
	Unisphere Explorers Ltd.	1,200	-
	Vauze Mines Ltd.	27,163	3,360
	Wiltsey-Coghlan Mines Ltd.	7,317	-

Table 46 - Exploratory Diamond Drilling in Quebec in 1963 and 1964 (Cont'd.)

Locality	Mine	Number of feet	
		1963	1964
Duparquet	Beattie-Duquesne Mines Ltd.	8,763	10,781
	Canadian Johns-Manville Co. Ltd.	2,980	-
	Garney Mines Ltd.	2,262	3,585
	Janlee Explorations Ltd.	-	540
Duprat	Barry Explorations Ltd.	-	598
	Barry Copper Mines Ltd.	-	1,393
	Crackingstone Mines Ltd..............	-	1,213
	Noranda Mines Ltd....................	1,009	-
	United Macfie Mines Ltd.	2,743	-
	Vauze Mines Ltd.	-	1,205
	Waite Lake Mines Ltd.	1,400	-
Duverny	Black River Mining Ltd.	-	1,980
Effiat	Southwest Potash Corporation	-	706
Estrées	Rio Tinto Canadian Exploration Ltd. .	3,123	2,503
Faber	Kelly Desmond Mining Corp. Ltd.	1,427	-
Fiedmont	Consolidated Mogador Mines Ltd.	5,396	27,800
	Sullico Mines Ltd.	1,481	1,380
Figuery	Canadian Johns-Manville Co. Ltd. ...	-	2,232
	Radiore Uranium Mines Ltd.	-	419
Fournière	Barnat Mines Ltd.	56,600	63,883
	Canadian Malartic Gold Mines Ltd. ...	5,284	-
	East Malartic Mines Ltd.	48,149	66,814
	Malartic Gold Fields Ltd.............	6,639	-
	Portland Yellowknife Gold Mines Ltd. .	750	-
Gaboury	Delhi Pacific Mines Ltd.	-	801
	Lorraine Mining Co. Ltd.	2,000	9,711
Galinée	Galinée Mattagami Mines Ltd.	2,065	-
	Mattagami Lake Mines Ltd.	-	55,681
	Mining Corporation of Canada Ltd. ...	7,444	-
	Orchan Mines Ltd.	3,955	21,662
	Selco Exploration Co. Ltd.	-	849
	Taché Lake Mines Ltd.	-	679
	Watson Lake Mines Ltd.	-	1,656
Garreau	Bersimis Mining Company (The)	3,000	-
Garthby	Sullico Mines Ltd.	6,165	-
Gaulin	Sullico Mines Ltd.	134	-
Grand-Calumet	Grand Calumet Mining Co. Ltd.	945	760
	Grand Calumet Mines Ltd.	-	6,184
	New Calumet Mines Ltd.	16,362	28,974
Grenville	Canadian Refractories Limited	15,725	11,782

Table 46 - Exploratory Diamond Drilling in Quebec in 1963 and 1964 (Cont'd.)

Locality	Mine	Number of feet	
		1963	1964
Guigues	Canadian Nickel Co. Ltd.	1,216	-
Guillet	Quebec Cobalt and Exploration Ltd.	934	1,396
Ham	Nicolet Asbestos Mines Ltd.	-	13,490
Ham-Sud	East Ventures Ltd.	732	-
Hartwell	American Chibougamau Mines Ltd.	737	-
Hauy	Muscocho Exploration Ltd.	1,597	-
Hemmingford	Indusmin Ltd.	1,500	-
Holland	Gaspé Copper Mines Ltd.	98,248	135,094
	New Peninsular Oil Ltd.	-	2,510
Houdet	American Chibougamau Mines Ltd.	-	2,083
Inverness	Nolet, Raoul	22	-
	Sullico Mines Ltd.	313	-
Ireland	Lake Asbestos of Quebec, Ltd.	33,133	28,068
Isle-Dieu	Ghislau Mining Corporation Ltd.	-	3,543
	Isle-Dieu Mattagami Mines Ltd.	699	2,414
	McIntyre Porcupine Mines Ltd.	1,130	-
	Noranda Mines Ltd.	5,281	1,021
	Radiore Uranium Mines Ltd.	11,467	12,319
Jesus (I)	Quebec Natural Gas Corporation	-	5,962
Joannes	Osisko Lake Mines Ltd.	780	-
Joutel	Cam Mines Ltd.	-	1,500
	Equity Explorations Ltd.	-	17,691
	Joutel Copper Mines Ltd.	27,314	18,485
	Mines de Poirier Inc.	-	32,971
	Mining Corporation of Canada (1964) Ltd.	-	8,454
	Rio Tinto Canadian Exploration Ltd.	-	1,812
	Southwest Potash Corporation	1,000	-
Lac Deux-Montagnes (Seign.)	General Managers Inc.	2,444	-
	Quebec Columbium Ltd.	767	1,057
	St. Lawrence Columbium and Metals Corp.	22,977	35,528
Lacorne	Molybdenite Corporation of Canada Ltd.	22,164	24,332
La Motte	Marbridge Mines Ltd.	4,333	30,006
	R. and P. Metals Corp. Ltd.	-	473
	Sullico Mines Ltd.	3,920	-
	Tormont Mines Ltd.	-	4,240
La Potardière	Mines Bern-Or Ltée (Les)	3,000	-
	Noranda Mines Ltd.	535	-
Lemieux	Calvert Gas and Oils Ltd.	-	10,000

Table 46 - Exploratory Diamond Drilling in Quebec in 1963 and 1964 (Cont'd.)

Locality	Mine	Number of feet 1963	Number of feet 1964
Lemieux	Rio Tinto Canadian Exploration Ltd. ..	751	-
	Sullico Mines Ltd.	-	2,400
Lesseps	Newmont Mining Corp. of Canada Ltd. ..	-	956
	Sullico Mines Ltd.	13,965	-
Lesueur	Coniagas Mines Ltd.	28,462	46,313
	Quebec Sturgeon River Mines Ltd.	-	351
	Sturgeon River Mines Ltd.	9,361	-
Le Tac	Canadian Nickel Co. Ltd.	2,701	-
Levy	Opémisca Explorers Ltd.	-	1,160
	Opemiska Copper Mines (Quebec) Ltd. ..	130,867	104,655
Ligneris	Tenendo Syndicate	-	600
Louvicourt	Bermont Mines Ltd.	-	4,807
	Bevcon Mines Ltd.	43,420	37,168
	Dunraine Mines Ltd.	-	1,993
	Naganta Mining and Development Co.Ltd.	-	6,118
	Newlund Mines Ltd.	2,644	-
	Sullico Mines Ltd.	7,276	38,312
	Uranium Ridge Mines Ltd.	-	3,420
Lozeau	Juma Mining Exploration Ltd.	998	-
McCorkill	McAdam Mining Corporation Ltd.	6,657	33,097
	Muscocho Exploration Ltd.	185	-
	United Obalski Mining Co. Ltd.	1,000	-
McKenzie	Bateman Bay Mining Company	-	1,980
	Bruneau Mines Ltd.	5,000	620
	Campbell Chibougamau Mines Ltd.	112,323	44,607
	Chib-Kayrand Copper Mines Ltd.	3,261	-
	Dauphin Iron Mines Ltd.	-	4,000
	McAdam Mining Corporation Ltd.	-	928
	Merrill Island Mining Corp. Ltd. ...	26,893	28,385
	Norbeau Mines Ltd.	-	1,309
	Patino Mining Corporation (The)	71,240	90,228
Maizerets	Rio Tinto Canadian Exploration Ltd. ..	1,700	-
Malartic	Black River Mining Ltd.	452	812
	Camador Mining Exploration Co. Ltd. ..	300	-
	Camflo Mattagami Mines Ltd.	25,505	24,792
	Chimo Gold Mines Ltd.	2,314	-
	Consolidated Mining and Smelting Co. of Canada Ltd.	3,704	-
	Delhi Pacific Mines Ltd.	1,904	-
	McWatters Gold Mines Ltd.	2,010	-

Table 46 - Exploratory Diamond Drilling in Quebec in 1963 and 1964 (Cont'd.)

Locality	Mine	Number of feet	
		1963	1964
Malartic	Proteus Minerals Ltd.	1,000	-
	Roycam Copper Mines Ltd.	6,007	-
	Salem Exploration Ltd.	1,550	-
	Snowdon Mining and Exploration Ltd...	1,000	1,000
Mann	Terra Nova Exploration Ltd.	1,000	-
Melbourne	Falconbridge Nickel Mines Ltd.	2,509	-
Montauban	Ghislau Mining Corporation Ltd.	-	7,322
Montbeillard	Black Bay Uranium Ltd.	8,367	-
	Odyno Exploration et Développement Ltée	-	82
Montbray	Barry Copper Mines Ltd.	-	133
	Mining Corporation of Canada (1964) Ltd.	-	1,377
	Noranda Mines Ltd.	4,044	6,717
Montgolfier	Louvicourt Goldfield Corporation	-	1,626
	Miro Mines Ltd.	-	2,900
Mont-Louis (Seign.)	Noranda Mines Ltd.	1,217	-
Morris	Dome Exploration Co. (Quebec) Ltd. ...	-	504
Nouveau Quebec (T)	Anaconda American Brass Ltd.	-	2,775
	Asbestos Corporation Ltd.	14,840	-
	Bilson Quebec Mines Ltd.	-	7,640
	Consolidated Red Poplar Minerals Ltd..	-	1,141
	Consolidated Mining and Smelting Co. of Canada Ltd.	-	3,927
	Frobex Ltd.	-	3,272
	Holannah Mines Ltd.	21,797	23,674
	Hollinger North Shore Exploration Co. Ltd.............	5,076	-
	Iron Ore Company of Canada	501	-
	McIntyre Porcupine Mines Ltd.	-	1,570
	Mid Chibougamau Mines Ltd.	-	1,646
	Mokta Exploration (Quebec) Inc.	-	3,640
	Raglan Quebec Mines Ltd.	41,675	31,818
	Sogemines Development Co. Ltd.	5,562	-
	Tyrone Mines Ltd.	-	4,661
Obalski	Icon Syndicate	-	935
	Muscocho Explorations Ltd.............	-	509
Opémisca	Phelps Dodge Corporation of Canada Ltd.	1,122	-
Panet	Coastal Mining Ltd.	-	920
	Sullico Mines Ltd.	-	1,962
Pascalis	Dome Exploration Co. (Quebec) Ltd.....	336	-
	New Pascalis Mines Ltd.	14,956	29,134
	Perron Gold Mines Ltd.	6,906	-

Table 46 - Exploratory Diamond Drilling in Quebec in 1963 and 1964 (Cont'd.)

Locality	Mine	Number of feet	
		1963	1964
Pascalis	Utopia Gold Mines Ltd.	-	363
Pershing	Syndicat Minier Pershing	-	944
Poirier	Astrabrun Mines Ltd.	-	2,742
	Bracemac Mines Ltd.	-	2,251
	Consolidated Red Poplar Minerals Ltd. .	-	5,991
	Coulee Lead and Zinc Mines Ltd.	-	2,226
	Kopan Developments Ltd.	-	1,189
	Mining Corporation of Canada Ltd. ...	3,524	-
	Northern Exploration Ltd.	16,004	31,128
	Payrock Mines Ltd.	-	4,714
	Peerless Canadian Explorations Ltd. ..	2,010	-
	Rio Algom Mines Ltd.	1,564	-
Potton	Sullico Mines Ltd.	-	441
Poularies	Magoma Mines Ltd.	3,387	-
Preissac	Anglo-American Molybdenite Ming. Corp.	1,024	3,022
	Dumont Nickel Corporation	-	5,087
	Preissac Molybdenite Mines Ltd.	28,157	33,343
	Quebec Moly Mining Corporation	-	4,732
Quevillon	Sullico Mines Ltd.	732	-
Queylus	Icon Syndicate	-	493
	Merrill Island Mining Corporation Ltd.	445	716
Rainboth	Vauze Mines Ltd.	-	600
Rannie	Westfield Minerals Ltd.	-	1,600
Rolette	Territory Mining Company Ltd.	-	3,196
Roux	Sullico Mines Ltd.	-	1,170
Rouyn	Cheskirk Mines Ltd.	5,165	2,013
	Kerr Addison Mines Ltd.	-	1,037
	Noranda Mines Ltd.	23,523	41,144
	Quemont Mining Corporation Ltd.	91,462	74,768
	South Dufault Mines Ltd.	16,011	1,711
	United Macfie Mines Ltd.	3,152	1,837
	Wiltsey-Coghlan Mines Ltd.	11,795	-
Roy	Campbell Chibougamau Mines Ltd.	67,192	16,609
	Chibougamau Asbestos Ltd.	1,548	-
	McAdam Mining Corporation Ltd.	-	1,027
	Quebec Smelting and Refining Ltd.	1,505	-
	Ran-Lux Mines Ltd.	-	1,179
St-Armand (Seign.)	East Ventures Ltd.	3,380	3,704
St-Canut (P)	Indusmin Ltd.	706	-

Table 46 - Exploratory Diamond Drilling in Quebec in 1963 and 1964 (Cont'd.)

Locality	Mine	Number of feet	
		1963	1964
Ste-Scholastique (P)	Indusmin Ltd.	8,000	7,000
Saguenay (County)	Matonipi Mines Ltd.	7,095	-
	Mount Wright Iron Mines Co. Ltd. ...	3,004	-
	Quebec Cartier Mining Company	-	4,086
Senneterre	Ghislau Mining Corporation Ltd.	-	3,731
	Glencona Exploration Mining Ltd.....	-	1,945
	Grandroy Mines Ltd.	-	2,675
	Newconex Canadian Exploration Ltd...	-	1,000
	Nisto Mines Ltd.	-	4,998
	Northwest Canalask Nickel Mines Ltd.	-	1,000
	Quebec Explorer Corporation Ltd.....	-	403
	Senneterre Goldfields Ltd.	-	1,744
	Transterre Explorations Ltd.	3,864	32,001
Senneville	Cuvier Mines Ltd.	1,989	-
Shipton	Nicolet Asbestos Mines Ltd.	3,000	-
Souart	Southwest Potash Corporation	-	468
Stratford	Bartlett Exploration and Investment Co. Ltd........	-	250
	Cupra Mines Ltd.	3,676	9,603
	Solbec Copper Mines Ltd.	2,579	12,048
Stukely	Sullico Mines Ltd.	-	1,140
Sutton	Sullico Mines Ltd.	-	1,174
Suzor	Laviolette Mining and Metallurgical Corporation	-	250
Talon	Sullico Mines Ltd.	-	1,250
	Uranium Ridge Mines Ltd.	1,442	-
Tavernier	Rio Tinto Canadian Exploration Ltd..	352	-
Thetford	Asbestos Corporation Ltd.	5,274	2,074
	Bell Asbestos Mines Ltd.	-	7,325
	National Asbestos Mines Ltd.	15,304	970
Tiblemont	Cam Mines Ltd.	-	3,606
	Fermont Mines Ltd.	2,526	-
	Janlee Explorations Ltd.	1,000	501
	Zulapa Mining Corporation Ltd.	-	21,469
Tingwick	Nicolet Asbestos Mines Ltd.	-	3,572
Trecesson	Transcona Explorations Ltd.	-	1,179
Urban	Urban Quebec Mines Ltd.	-	1,710
Valrennes	Massval Mines Ltd.	-	2,012
	Paudash Mines Ltd.	-	1,316

Table 46 - Exploratory Diamond Drilling in Quebec in 1963 and 1964 (Concluded)

Locality	Mine	Number of feet	
		1963	1964
Valrennes	Tazin Mines Ltd.	2,007	-
Vassal	Rio Tinto Canadian Exploration Ltd..	350	-
Vassan	D'Aragon Mines Ltd.	3,000	-
	Fermont Mines Ltd.	2,920	-
	Grandroy Mines Ltd.	996	-
	Nemrod Mining Co. Ltd.	4,130	8,443
	Norlartic Mines Ltd.	20,017	22,475
	Proteus Minerals Ltd.	1,500	-
	Western Quebec Mines Co. Ltd.	5,115	-
Vauquelin	Black River Mining Ltd.	-	14,748
	Chimo Gold Mines Ltd.	3,828	27,553
Verchères, Richelieu (Counties)	Huiles Prospères Inc. (Les)	3,538	-
Villemontel	Rio Tinto Canadian Exploration Ltd..	575	-
Weedon	Sullico Mines Ltd.	-	677
Wexford	Black River Mining Ltd.	-	1,505
	Drummond Copper Corporation Ltd. ...	285	288
	Tamara Mining Ltd.	320	211
Wilson	Kerr Addison Mines Ltd.	-	822
	Mining Corporation of Canada (1964) Ltd.......	-	2,497
745	Bersimis Mining Company (The)	-	4,202
1224	Taché Lake Mines Ltd.	1,521	-
1304	Area Mines Ltd.	604	-
1323	Mining Corporation of Canada Ltd....	1,141	-
1408	McWatters Gold Mines Ltd............	-	2,454
	Norpax Nickel Mines Ltd.	-	771
1424	Icon Syndicate	-	1,053
1931	Taché Lake Mines Ltd.	-	398
1931,2031	Merrill Island Mining Corp. Ltd. ...	5,167	259

Table 47a General Mining Operations in Quebec in 1963

(As reported in annual reports of mining companies when available)

Mining Company	Lateral Work (Feet)	Raising (Feet)	Shaft Sinking (Feet)	Exploratory Diamond Drilling (Feet)
Akasaba Gold Mines Ltd.	--	---	--	1,678
Anglo American Molybdenite Corporation Ltd.	--	--	400	31,314
Barnat Mines Limited	4,819	5,386	--	57,437
Bevcon Mines Limited	3,456	7,808	--	40,879
Bruneau Mines Limited	999	---	--	1,600
Camflo Mattagami Mines Limited	--	--	390	8,700
Campbell Chibougamau Mines Limited	15,964	3,701	63	179,525
Canadian Malartic Gold Mines Limited	1,772	1,335	--	--
Coniagas Mines Limited (The)	1,629	1,098	--	28,463
Copperstream-Frontenac Mines Limited	--	--	--	3,000
Cupra Mines Limited	--	--	2,250	--
East Malartic Mines Limited	8,894	--	1,045	--
Gaspé Copper Mines Limited	11,060	2,721	--	--
Iron Ore Company of Canada	--	--	--	13,389
Joutel Copper Mines Limited	2,000	--	285	20,000
Kiena Gold Mines Limited	6,479	150	219	19,509
Lake Dufault Mines Limited	2,400	1,146	1,996	60,128
Lamaque Mining Company Limited	875	--	--	19,700
Lorraine Mining Company Limited	--	--	545	--
Malartic Gold Fields Limited	134	--	--	6,639
Malartic Hygrade Gold Mines Limited	2,185	--	--	--
Manitou-Barvue Mines Limited	12,392	3,592	--	27,684
Marban Gold Mines Limited	3,544	1,767	--	32,765
Marbridge Mines Limited	2,616	831	308	7,505
Mattagami Lake Mines Limited	10,976	5,982	--	13,638
Merrill Island Mining Corporation Limited	2,553	2,823	--	24,522
Merrill-Obalski Mines Limited	--	--	--	17,442
New Calumet Mines Limited	2,474	--	--	15,296
New Hosco Mines Limited	5,879	3,537	--	10,590
Noranda Mines Limited	11,920	599	--	--
Norlartic Mines Limited	69	443	--	20,520
Normetal Mining Corporation Limited	6,921	594	--	17,258
Opemiska Copper Mines (Quebec) Ltd.	23,779	11,312	--	130,867
Orchan Mines Limited	10,512	6,244	--	3,955
Patino Mining Corporation (The)	18,055	3,565	1,274	69,748
Peel-Elder Limited	4,202	1,054	755	860
Preissac Molybdenite Mines Limited	7,228	1,337	229	28,157
Quebec Chibougamau Goldfields Ltd.	1,355	1,561	--	1,282
Quemont Mining Corporation Ltd.	6,406	553	--	91,462
Rio Algom Mines Limited	2,210	--	1,275	1,864
Sigma Mines (Quebec) Limited	644	150	1,575	2,450
Solbec Copper Mines Limited	2,464	586	--	--
Sturgeon River Mines Limited	96	--	1,111	9,361
Sullivan Consolidated Mines Limited	--	100	--	--
Vauze Mines Limited	971	1,816	---	25,040

Table 47b- General Mining Operations in Quebec in 1964

(As reported in annual reports of mining companies when available)

Mining Company	Lateral Work (Feet)	Raising (Feet)	Shaft Sinking (Feet)	Exploratory Diamond Drilling (Feet)
Anglo American Molybdenite Corporation Ltd.	1,627	1,627	--	3,022
Barnat Mines Limited	3,500	3,932	--	63,983
Bevcon Mines Limited	4,860	1,150	--	37,168
Bruneau Mines Limited	607	40	--	636
Camflo Mattagami Mines Limited	5,785	600	646	--
Campbell Chibougamau Mines Limited	8,389	1,620	--	61,216
Canadian Malartic Gold Mines Limited	--	--	--	--
Coniagas Mines Limited (The)	6,045	3,757	--	7,501
Continental Titanium Corporation	--	--	--	1,000
Cupra Mines Limited	--	--	--	--
East Malartic Mines Limited	17,830	--	--	66,814
Gaspé Copper Mines Limited	7,078	3,404	--	--
Iron Ore Company of Canada	--	--	--	13,507
Joutel Copper Mines Limited	1,426	39	--	18,485
Kiena Gold Mines Limited	--	--	1,105	--
Lake Dufault Mines Limited	8,918	5,485	--	49,949
Lamaque Mining Company Limited	3,000	700	--	3,843
Lorraine Mining Company Limited	4,332	1,353	533	9,711
Malartic Gold Fields Limited	--	--	--	--
Malartic Hygrade Gold Mines Limited	--	--	--	--
Manitou-Barvue Mines Limited	--	--	--	--
Marban Gold Mines Limited	3,517	1,648	--	42,465
Marbridge Mines Limited	1,582	--	187	22,370
Mattagami Lake Mines Limited	6,905	7,813	--	59,287
Merrill Island Mining Corporation Ltd.	4,730	2,986	--	26,579
Molybdenite Corporation of Canada Ltd.	--	--	--	25,205
New Calumet Mines Limited	2,953	662	134	28,974
New Hosco Mines Limited	3,744	872	--	4,800
Noranda Mines Limited	--	--	--	28,400
Norbeau Mines (Quebec) Limited	2,293	1,436	809	2,399
Norlartic Mines Limited	1,270	--	--	18,253
Normetal Mining Corporation Limited	3,850	1,023	229	25,998
Northern Exploration Limited	--	--	606	28,356
Opemiska Copper Mines (Quebec) Ltd.	13,536	3,374	--	33,348
Orchan Mines Limited	6,592	4,430	--	23,638
Patino Mining Corporation (The)	25,336	6,365	18	69,926
Peel-Elder Limited	413	484	--	827
Mines de Poirier Incorporée	4,070	1,575	588	32,971
Preissac Molybdenite Mines Limited	15,854	5,200	--	33,343
Quebec Chibougamau Goldfields Ltd.	2,805	1,182	--	7,341
Quemont Mining Corporation Ltd.	3,796	4,700	--	74,768
Sigma Mines (Quebec) Limited	449	--	800	--
Sullivan Consolidated Mines Limited	5,241	--	--	70,157
United Obalski Mining Company Ltd.	1,637	770	38	3,150
Vauze Mines Limited	--	175	--	2,571
Wasamac Mines Limited	1,300	693	54	3,568

Table 48a - Production from Gold Mines in Quebec in 1963

(As reported in annual reports of mining companies when available)

Mine	Ore Treated (Tons)	Recovery		Gold Recovered per Ton of Ore Treated (Ounces)
		Gold (Ounces)	Silver (Ounces)	
Akasaba Gold Mines Ltd.	31,184	4,007	1,475	0.128
Barnat Mines Ltd.	575,555	62,217		0.108
Bevcon Mines Ltd.	248,450	28,459	10,694	0.114
Canadian Malartic Gold Mines Ltd.	330,434	27,191	25,599	0.082
East Malartic Mines Ltd.	507,003	74,659		0.147
Lamaque Mining Co. Ltd.	766,300	124,817	21,641	0.176
Malartic Goldfields Ltd.	146,800	20,515		0.140
Malartic Hygrade Gold Mines Ltd.	24,945	16,659		0.668
Marban Mines Ltd.	142,269	24,197		0.171
Norlartic Mines Limited	163,087	21,755	2,332	0.133
Peel Elder Ltd.	2,240	2,253		
Sigma Mines Limited	423,058	77,714		0.184
Sullivan Cons. Mines Ltd.	260,807	48,764	11,800	0.187

Table 48b - Production from Gold Mines in Quebec in 1964

(As reported in annual reports of mining companies when available)

Mine	Ore Treated (Tons)	Recovery		Gold Recovered per Ton of Ore Treated (Ounces)
		Gold (Ounces)	Silver (Ounces)	
Barnat Mines Ltd.	581,266	63,113		0.108
Bevcon Mines Ltd.	242,085	30,143	10,624	0.124
Canadian Malartic Gold Mines Ltd.	329,388	31,735	13,952	0.096
East Malartic Mines Ltd.	470,122	70,248		0.149
Lamaque Mining Co. Ltd.	767,190	124,501	21,352	0.168
Malartic Goldfields Ltd.	122,771	13,446		0.110
Marban Gold Mines Ltd.	157,872	23,729		0.15
Norlartic Mines Ltd.	165,596	19,919		0.12
Peel Elder Ltd.	108,932	12,456		0.114
Sigma Mines Ltd.	439,134	77,849		0.177
Sullivan Cons. Mines Ltd.	254,258	43,262	9,803	0.172
Norbeau Mines Ltd.	22,983	9,949	1,240	0.432

Table 49a - Ore Reserves of Producing Gold Mines in Quebec in 1963

(As reported in annual reports of mining companies when available)

Mine	Reserves		Tons Treated in 1963	Average Rate of Recovery	Commencement of Operations
	Tons	Gold Content Oz./Ton			
Akasaba Gold Mines Ltd.	-	-	31,184	91.7	1960
Barnat Mines Ltd.	1,698,779	0.177	575,555	92	1938
Bevcon Mines Ltd.	361,392	0.135	248,450	91.5	1952
Canadian Malartic Gold Mines Ltd.	198,000	0.088	330,434	89	1935
East Malartic Mines Ltd.	1,680,943	0.161	507,003	95.4	1938
Lamaque Mining Co. Ltd.	2,354,316	0.184	766,300	96.6	1935
Malartic Goldfields Ltd.	85,000	0.14	146,800	95.4	1939
Malartic Hygrade Gold Mines Ltd.	-	-	24,945	-	1963
Marban Gold Mines Ltd.	293,000	0.165	142,269	95.7	1961
Norlartic Mines Ltd.	315,000	0.16	163,087	94.2	1959
Peel-Elder Ltd.	-	-	2,240	91.6	1946
Sigma Mines Ltd.	1,345,000	0.226	423,058	96.1	1937
Sullivan Cons. Mines Ltd.	651,432	0.218	260,807	95.8	1934
Norbeau Mines (Quebec) Ltd.	150,000	0.46	-	-	-

Table 49b - Ore Reserves of Producing Gold Mines in Quebec in 1964

(As reported in annual reports of mining companies when available)

Mine	Reserves		Tons Treated in 1964	Average Rate of Recovery	Commencement of Operations
	Tons	Gold Content Oz./Ton			
Barnat Mines Ltd.	1,426,228	0.139	581,266	92	1938
Bevcon Mines Ltd.	350,922	0.130	242,085	91.5	1952
Canadian Malartic Gold Mines Ltd.	-	-	329,388	89	1935
East Malartic Mines Ltd.	1,558,254	0.156	470,122	95.4	1938
Lamaque Mining Co. Ltd.	2,346,464	0.183	767,190	96.6	1935
Malartic Goldfields Ltd.	-	-	122,771	95.4	1939
Marban Gold Mines Ltd.	345,000	0.16	157,872	95.7	1961
Norlartic Mines Ltd.	170,000	0.15	165,596	94.2	1959
Peel-Elder Ltd.	-	-	108,932	-	1946
Sigma Mines Ltd.	1,394,230	0.228	439,134	96.1	1937
Sullivan Cons. Mines Ltd.	632,888	0.210	254,258	95.8	1934
Norbeau Mines (Quebec) Ltd.	151,482	0.48	22,983	96.5	1964

Table 50a - Production of Base-metal Mines in Quebec in 1963

(As reported in annual reports of mining companies when available)

Mine	Tons Treated	Production					
		Copper (Pounds)	Zinc (Pounds	Lead (Pounds)	Gold (Ounces)	Silver (Ounces)	Others
Campbell Chibougamau Mines Ltd.	772,505	29,546,735	-	-	24,429	200,446	-
Coniagas Mines Ltd.	111,418	-	28,000,222	1,904,634	10,294	622,682	-
Gaspé Copper Mines Ltd.	2,676,300	95,600,000	-	-	9,900	516,000	47,000 lbs. Bi
Manitou-Barvue Mines Ltd.	467,365	5,113,577	17,837,422	2,018,878	9,002	590,322	
Marbridge Mines Ltd.	141,265	-	-	-	-	-	29,889T. conc. Ni
Mattagami Mines Ltd.	166,725	1,636,542	33,141,976	-	-	-	-
Merrill-Island Mining Corp.	157,691	7,212,891	-	-	2,575	65,668	-
New Calumet Mines Ltd.	93,360	185,345	12,267,535	3,422,528	1,374	289,403	-
New Hosco Mines Ltd.	44,000	1,629,200	-	-	-	-	-
Noranda Mines Ltd.	1,235,771	46,158,000	-	-	198,400	-	201,000 T. Py.
Normetal Mining Corp. Ltd.	345,384	17,236,150	29,488,025	-	6,136	483,598	49,015 T. Py.
Opemiska Copper Mines (Quebec) Ltd. .	737,543	41,690,690	-	-	17,242	276,653	-
Orchan Mines Ltd.	35,950	413,290	5,618,400	-	151	11,453	-
Patino Mining Corp. (The)	675,730	32,144,093	-	-	34,235	143,473	-
Quemont Mining Corp. Ltd.	803,003	18,046,591	25,996,311	-	101,434	425,048	248,171 T. Py.
Solbec Copper Mines Ltd.	191,033	6,658,816	14,370,165	1,709,769	11,262	152,970	68,164 lbs. Cd
Sullico Mines Ltd.	1,017,575	11,974,940	3,543,077	-	3,791	134,755	-
Vauze Mines Ltd.	115,878	7,002,100	3,482,400	-	2,150	87,500	-

Table 50b - Production of Base-metal Mines in Quebec in 1964

(As reported in annual reports of mining companies when available)

Mine	Tons Treated	Production					
		Copper (Pounds)	Zinc (Pounds)	Lead (Pounds)	Gold (Ounces)	Silver (Ounces)	Others
Campbell Chibougamau Mines Ltd.	870,067	31,169,640	-	-	29,653	225,681	-
Coniagas Mines Ltd.	114,459	-	-	-	6,537	335,230	-
Gaspé Copper Mines Ltd.	2,725,300	86,640,000	18,152,598	1,215,315	11,350	521,000	58,000 lbs. Bi
Lake Dufault Mines Ltd.	112,117	10,339,640	12,188,338	-	3,054	192,704	-
Manitou-Barvue Mines Ltd.	387,905	3,775,452	13,277,314	1,277,625	13,782	409,992	-
Marbridge Mines Ltd.	146,338	156,921	-	-	-	-	- Ni
Mattagami Lake Mines Ltd.	1,282,072	13,143,728	291,111,744	-	-	-	-
Merrill-Island Mining Corp. Ltd.	143,746	7,014,877	-	-	3,105	71,443	-
New Calumet Mines Ltd.	94,823	186,778	11,504,103	3,161,133	1,286	289,070	-
New Hosco Mines Ltd.	218,686	8,050,645	-	-	-	-	-
Noranda Mines Ltd.	1,250,650	51,372,000	-	-	205,100	-	252,000 T. Py.
Normetal Mining Corp. Ltd.	348,924	12,290,664	43,282,388	-	5,099	429,818	8,507 T. Py.
Opemiska Copper Mines Ltd.	748,990	40,709,632	-	-	16,966	281,797	-
Orchan Mines Ltd.	369,272	6,344,000	80,381,000	-	3,200	213,750	-
Patino Mining Corp. Ltd.	674,131	30,513,559	-	-	36,986	186,006	-
Quemont Mining Corp. Ltd.	752,691	16,007,703	27,147,668	-	84,331	358,589	191,247 T. Py.
Solbec Copper Mines Ltd.	368,507	11,424,938	25,156,878	2,556,635	2,350	252,736	125,011 lbs. Cd
Sullico Mines Ltd.	990,669	10,569,640	5,135,802	-	5,752	143,355	25,980 lbs. Cd
Vauze Mines Ltd.	126,756	332,800	-	-	986	15,902	-

Table 51a - Ore Reserves at Base-metal Mines in Quebec in 1963

(As reported in annual reports of mining companies when available)

Mine	Reserves (Tons)	Copper Content %	Zinc Content %	Lead Content %	Nickel Content %	Gold Content Oz./Ton	Silver Content Oz./Ton	Tons Treated in 1963	Commencement of Operations
Campbell Chibougamau Mines Ltd.	9,445,117	2.32				0.059		772,505	1956
Coniagas Mines Ltd.	196,048		8.19				3.96		
Gaspé Copper Mines Ltd.	54,866,000	1.20						2,676,300	1955
Manitou-Barvue Mines Ltd.	851,465	1.13	5.42			0.022	2.29	467,365	1942
Marbridge Mines Ltd.	143,330				2.28			141,265	1961
Mattagami Lake Mines Ltd.	21,377,061	0.79	12.43			0.0155	1.15	166,725	1963
Merrill-Island Mining Corp. Ltd	182,088	3.33				0.02	0.46	157,691	1958
New Calumet Mines Ltd.	406,521		8.21	2.22		0.016	4.03	93,360	1943
New Hosco Mines Ltd.	2,187,000	2.70						44,000	1963
Noranda Mines Ltd.								1,235,771	1927
Sulfide ore	6,195,500	2.39				0.18			
Flux ore	271,200					0.23			
Chadbourne	1,550,000					0.13			
Zone No. 5	320,000					0.23			
Zone No. 5	1,500,000	0.70				0.12			
Joliet (fluxing)	1,352,000	1.00							
Normetal Mining Corp. Ltd.	1,552,600	2.5	8.3					345,384	1937
Opemiska Copper Mines (Quebec) Ltd.	2,818,000	3.27						737,543	1954
Orchan Mines Ltd.	3,140,000	1.24	11.63			0.016	1.41	35,950	1963
Patino Mining Corp. Ltd.	4,142,000	2.68				0.069		675,730	1960
Quemont Mining Corp. Ltd.	3,360,000	1.27	2.86			0.168	1.0	803,003	1949
Solbec Copper Mines Ltd.	1,023,446	2.11	3.79	0.51		0.019	1.33	191,033	1962
Sullico Mines Ltd.	1,560,000	0.84	0.25				0.19	1,017,575	1943
Vauze Mines Ltd.	105,000	1.6						115,878	1961

Table 51b- Ore Reserves at Base-metal Mines in Quebec in 1964

(As reported in annual reports of mining companies when available)

Mine	Reserves (Tons)	Copper Content %	Zinc Content %	Lead Content %	Nickel Content %	Gold Content Oz./Ton	Silver Content Oz./Ton	Tons Treated in 1964	Commencement of Operations
Campbell Chibougamau Mines Ltd.	9,190,595	2.24				0.058		870,067	1956
Coniagas Mines Ltd.	283,735		8.25				3.58	114,459	1961
Gaspé Copper Mines Ltd.	66,297,000	1.06						2,725,300	1955
Lake Dufault Mines Ltd.	2,189,500	3.9	7.0			0.03	2.0	112,117	1964
Manitou-Barvue Mines Ltd.	1,061,696	1.18	3.59			0.016	1.10	387,905	1942
Marbridge Mines Ltd.	235,000				2.70			146,338	1961
Mattagami Lake Mines Ltd.	18,860,820	0.70	10.8			0.014	1.15	1,282,072	1963
Merrill-Island Mining Corp. Ltd.	104,287	2.95				0.025	0.51	143,746	1958
New Calumet Mines Ltd.	396,787		9.54	2.79		0.015	5.27	94,823	1943
New Hosco Mines Ltd.	766,000	2.98						218,686	1963
Noranda Mines Ltd.								1,250,650	1927
Sulfide ore	5,234,900	2.48				0.18			
Flux ore	252,600					0.24			
Chadbourne	1,550,000					0.13			
Zone No. 5	320,000					0.23			
Zone No. 5	1,500,000	0.70				0.12			
Joliet (Fluxing)	957,000	1.00							
Normetal Mining Corp. Ltd.	1,545,000	2.38	8.91					348,924	1937
Opemisca Copper Mines Ltd.	2,744,000	3.25						748,990	1954
Orchan Mines Ltd.	2,985,950	1.28	11.55			0.016	1.37	369,272	1963
Patino Mining Corp. Ltd. (The)	4,487,000	2.49				0.061		674,131	1960
Quemont Mining Corp. Ltd.	2,290,000	1.23	2.61			0.17	0.99	752,691	1949
Solbec Copper Mines Ltd.	1,032,937	1.83	4.46	0.66		0.02	1.54	368,507	1962
Sullico Mines Ltd.	1,177,000	0.70	0.19				0.14	990,669	1943
Vauze Mines Ltd.	8,000	1.4						126,756	1961

Table 52a - Production of Iron and Titaniferous Iron Mines in Quebec in 1963

(From annual reports of companies and other publications)

Mining Company	Ore Mined (Tons)	Average Tenor of Ore Mined	Product of Iron (Titaniferous) Shipped (Tons)	Average Tenor of Iron (Titaniferous) Shipped	Titanium Dioxide Slag Shipped (Tons)	Average Content of Slag TiO_2	Metallic Iron Shipped (Tons)	Commencement of Operations
Continental Titanium Corp.	26,500 (1)	- --	- - -	- - -	- - -	- - -	- - -	1957
The Hilton Mines	3,200,000 (2)	20% Fe	958,000(3)	66.3% Fe	- - -	- - -	- - -	1958
Iron Ore Co. of Canada ...	7,500,000	54.2% Fe	7,500,000(4)(6)	54,2% Fe	- - -	- - -	- - -	1954
Quebec Cartier Mng.	14,000,000 (2)	32.8% Fe	7,100,000(5)	64.5% Fe	- - -	- - -	- - -	1961
Quebec Iron and Titanium .	900,000	40% Fe	- - -	40% Fe	379,000	72%	250,000	1951
		35% TiO_2	900,000	35% TiO_2	- - -	- - -	- - -	

Total tonnage shipped from Quebec Province: 11.8 million tons; value $124 million.

1) To be used as heavy aggregate
2) Calculated figure.
3) Pellets
4) Total production for Quebec and Newfoundland
5) Crude concentrate
6) Crude ore shipped

Table 52b - Production of Iron and Titaniferous Iron Mines in Quebec in 1964

(From annual reports of companies and other publications)

Mining Company	Ore Mined (Tons)	Average Tenor of Ore Mined	Product of Iron (Titaniferous) Shipped (Tons)	Average Tenor of Iron (Titaniferous) Shipped	Titanium Dioxide Slag Shipped (Tons)	Average Tenor of TiO_2	Metallic Iron Shipped (Tons)	Commencement of Operations
Continental Titanium Corp.	unknown (1)	- - -	- - -	- - -	- - -	- - -	- - -	1957
The Hilton Mines	3,300,000(2)	20% Fe	1,007,000(3)	66.3% Fe	- - -	- - -	- - -	1958
Iron Ore Co. of Canada ...	8,600,000	54.2% Fe	8,600,000(4)(6)	54.2% Fe	- - -	- - -	- - -	1954
Quebec Cartier Mng.	20,000,000(2)	32.8% Fe	10,000,000(5)	64.5% Fe	- - -	- - -	- - -	1961
Quebec Iron and Titanium .	1,400,000	40% Fe 35% TiO_2	1,400,000	40% Fe 35% TiO_2	545,000	72%	376,000	1951

Total tonnage shipped from Quebec Province: 15.4 million tons; value $156 million.

1) To be used as heavy aggregate
2) Calculated figure
3) Pellets
4) Total production for Quebec and Newfoundland
5) Crude concentrate
6) Crude ore shipped

Table 53a - Production of Other Metallic Substances by Quebec Mines in 1963

(From annual reports of companies and other publications)

Mining Company	Ore Treated (Tons)	Bismuth (Pounds)	Cadmium (Pounds)	Columbium (Pounds) Cb_2O_5	Molybdenum (Pounds)	Lithium (Pounds) Li_2CO_3	Ore Reserves in 1963 (Tons)	Ore Reserves in 1963 (Tons)	Commencement of Operations
Gaspé Copper Mines	2,676,000	47,000	- - -	- - - -	- - - -	- - - -	54,866,000	**See Table 51a**	1955
Molybdenite Corp. of Canada	289,672	145,158	- - -	- - - -	806,509	- - - -	287,042	0.30% MoS_2	1942
Quebec Lithium Corp. ...	- - - -	- - -	- - -	- - - -	- - - -	1,383,700	20,000,000	1.3% Li_2O	1955
St. Lawrence Columbium Metals	291,400	- - -	- - -	1,393,536	- - - -	- - - -	17,000,000	0.36% Cb_2O_5	1961
Solbec Copper Mines	191,000	- - -	68,164	- - - -	- - - -	- - - -	1,023,000	**See Table 51a**	1962

Table 53b - Production of Other Metallic Substances by Quebec Mines in 1964

(From annual reports of companies and other publications)

Mining Company	Ore Treated (Tons)	Bismuth (Pounds)	Cadmium (Pounds)	Columbium (Pounds) Cb_2O_5	Molybdenum (Pounds)	Lithium (Pounds) Li_2CO_3	Ore Reserves in 1964		Commencement of Operations
							(Tons)	(Tons)	
Gaspé Copper Mines .	2,725,000	58,000	- - -	- - - -	444,500	- - - -	66,297,000	**See Table 51b**	1955
Molybdenite Corp. of Canada	277,000	149,088	- - -	- - - -	751,101	- - - -	282,667	0.28% MoS_2	1942
Preissac Molybdenite Mines Ltd.	74,000	- - - -	- - -	- - - -	- - - -	- - - -	2,200,000	0.477% MoS_2	1964
Quebec Lithium Corp.	- - - -	- - - -	- - -	- - - -	- - - -	1,821,250(1)	20,000,000	1.3% Li_2O	1955
St. Lawrence Columbium Metals .	321,000			2,091,725	- - - -	- - - -	17,000,000	0.36% Cb_2O_5	1961
Solbec Copper Mines	368,507	- - - -	125,666	- - - -	- - - -	- - - -	1,033,000	**See Table 51b**	1962
Sullico Mines Ltd. .	990,669	- - - -	25,980	- - - -	- - - -	- - - -	1,177,000	**See Table 51b**	1943

1) A quantity of lithium hydroxide monohydrate was also manufactured in 1964 - quantity not published.

EMPLOYMENT, WAGES AND ACCIDENTS IN MINES AND QUARRIES IN 1963 AND 1964

EMPLOYMENT

During 1963 the mining industry of Quebec provided employment for 34,117 men, an increase of 785 compared with the figure of the preceding year.

For the year 1964 the corresponding figure was 34,086, a decrease of 86 compared to 1963.

In the mines, during 1963, the number of men employed in development and production of metallic substances increased by 739 compared with 1962. In quarries, there was an increase of 46. Corresponding figures for 1964 were, respectively, an increase of 214 and a decrease of 245.

During 1963 the total number of man-hours worked was 65,925,784 and, during 1964, this number was 67,779,812 man-hours.

Employment in 1963 was distributed among 395 mines, mining contractors and exploration companies, 166 quarries, 3,603 sand and gravel pits of which 1,896 were operated by the Quebec Department of Roads and 803 by the Quebec Department of Agriculture and Colonization, 28 diamond drilling contractors and numerous claim holders who carried out assessment work.

For the year 1964 the corresponding figures were as follows: 409 mines, mining contractors and exploration companies, 164 quarries, 3,535 sand and gravel pits of which 1,813 were operated by the Quebec Department of Roads and 756 by the Agriculture and Colonization Department, as well as 27 diamond drilling contractors in addition to numerous claim holders who carried out assessment work.

Table 54- Men Employed in Mines and Quarries in Quebec from 1958 to 1964

	1958	1959	1960	1961	1962	1963	1964
Number of men employed	31,927	32,984	32,245	31,898	33,332	34,117	34,086
Number of million man-hours worked	61.203	63.250	60.984	62.269	64.227	65.925	67.779

Tables 55a and 55b show the distribution of personnel among the different branches of the mining industry for 1963 and 1964.

Table 55a. - Personnel Employed by the Mining Industry of Quebec in 1963 (by substances)

Substance	Number of Employees	Number of Hours Worked	Salaries and Wages	Number of 300-day Workers (a)
METALLICS				
Columbium, uranium	99	254,509	$ 433,575	106
Copper (includes sulfur and selenium)	6,887	14,028,929	33,035,730	5,845
Gold	2,821	6,154,696	11,144,049	2,564
Iron and titaniferous iron (titanium oxide)	5,184	10,982,280	33,599,000	4,576
Molybdenum	252	551,191	1,001,916	230
Nickel	148	279,197	615,003	116
Zinc and lead	1,127	2,642,746	4,998,470	1,101
Total: Metallics	16,518	34,893,548	$ 84,827,743	14,538
NON-METALLICS				
I - Industrial Minerals				
Asbestos	5,977	12,291,785	$ 30,432,244	5,122
Feldspar	33	54,083	90,697	23
Lime	223	420,478	851,509	175
Lithium	126	283,205	471,670	118
Magnesitic dolomite and brucite	358	767,480	1,728,389	320
Mica	33	23,980	34,916	10
Ochre and iron oxide	13	28,100	36,252	12
Petroleum	43	17,899	40,778	7
Peat	858	1,281,506	1,394,725	534
Quartz and industrial sand	147	293,460	544,765	122
Soapstone and talc	22	56,998	74,399	24
Others (graphite, kaolin, marl)............	9	22,410	41,086	9
Total: Industrial minerals	7,842	15,541,384	$ 35,741,430	6,476
II - Building Materials				
Cement	903	1,909,966	$ 5,058,252	796
Clay products	728	1,484,787	2,923,815	619
Granite	937	1,841,487	3,384,654	767
Limestone	1,790	3,833,819	6,901,136	1,597
Marble	46	54,640	67,867	23
Sand and gravel	4,540	4,676,451	5,753,007	1,949
Sandstone	151	223,631	341,072	93
Slate and schist	1	330	650	
Total: Building materials	9,096	14,025,111	$ 24,430,453	5,844
Diamond drilling contractors	661	1,465,741	$ 3,008,549	611
GRAND TOTAL	34,117	65,925,784	$148,008,175	27,469

(a) Number of hours divided by 2,400.

Mineral statistics, Bureau of Statistics of Quebec.

Table 55b. - Personnel Employed by the Mining Industry of Quebec in 1964 (by substances)

Substance	Number of Employees	Number of Hours Worked	Salaries and Wages	Number of 300-day Workers (a)
METALLICS				
Columbium, chrome	106	273,045	$ 537,659	114
Copper (sulfur, tellurium, cadmium and selenium)	6,774	13,871,808	33,088,592	5,780
Gold	2,830	6,422,851	12,080,102	2,676
Iron and titaniferous iron (titanium oxide)	4,933	10,748,052	33,852,576	4,478
Molybdenum	509	1,071,145	1,871,424	446
Nickel (cobalt)	253	408,228	923,069	170
Zinc and lead	1,610	3,620,239	7,458,697	1,508
Total metals	17,015	36,415,368	$ 89,812,119	15,172
NON-METALLICS				
I - Industrial Minerals				
Asbestos	5,644	12,208,743	$ 32,421,225	5,087
Feldspar	32	51,263	85,722	21
Lime	149	316,071	665,241	132
Lithium	143	307,418	495,626	128
Magnesitic dolomite and brucite	355	772,287	1,764,154	322
Mica	18	18,970	29,887	8
Ochre and iron oxide	18	23,520	33,656	10
Petroleum	34	31,800	72,393	13
Peat	816	1,187,643	1,415,801	495
Quartz and industrial sand	208	406,598	823,862	170
Soapstone and talc	21	60,044	72,318	25
Others (graphite, kaolin, phosphate, marl)	13	29,936	60,315	13
Total: Industrial minerals	7,451	15,416,293	$ 37,940,200	6,424
II - Building Materials				
Slate and schist	72	131,570	$ 227,825	55
Limestone	1,948	4,380,290	8,408,250	1,825
Cement	981	2,053,584	5,447,169	856
Granite	871	1,799,545	3,486,884	750
Sandstone	195	369,990	614,772	154
Marble	49	92,315	135,719	38
Clay products	721	1,347,207	2,916,749	561
Sand and gravel	4,014	4,257,241	5,407,625	1,774
Total: Building materials	8,851	14,431,742	$ 26,644,793	6,013
Diamond drilling contractors	769	1,516,409	$ 3,189,049	632
GRAND TOTAL	34,086	67,779,812	$157,586,161	28,241

(a) Number of hours divided by 2,400

Mineral statistics, Bureau of Statistics of Quebec

WAGES

Salaries paid to mine and quarry workers in Quebec during 1963 totalled $148,008,175 compared with $139,275,019 in 1962. In 1964 salaries paid totalled $157,586,161.

Details concerning wages and employment in the various branches of the mining industry for 1963 and 1964 are listed in Tables 56a and 56b. Of the total, workmen in mines received $123,577,722 and quarry workers, $24,430,453, compared with $117,266,078 and $22,008,941 in 1962. Corresponding figures for 1964 are as follows: mine workers received $130,941,368 and quarry workmen, $26,644,793.

The average wage per man per 300 days of work in the mines was $5,714 compared with $5,561 for the preceding year. The corresponding figure for 1964 is $5,891.

The average wage per man per 300 days of work in the quarries, sand and gravel pits was $4,180 compared with $3,856 for the previous year. For 1964 the corresponding figure was $4,431.

Table 56a - Employees in the Mining Industry of Quebec in 1963
(by industries)

	Number of Employees	Salaries and Wages $	Number of Man-hours of Work	Number of 300-day Workers
Producing mines	23,597	117,796,582	49,301,081	20,541
Non-producing mines ..	763	2,772,591	1,133,851	473
Quarries, sand and gravel pits	9,096	24,430,453	14,025,111	5,844
Diamond drilling contractors	661	3,008,549	1,465,741	611
Total	34,117	148,008,175	65,925,784	27,469

Table 56b Employees in the Mining Industry of Quebec in 1964 (by industries)

	Number of Employees	Salaries and Wages	Number of Man-hours of Work	Number of 300-day Workers
Producing mines	23,657	$124,794,682	50,540,964	21,059
Non-producing mines	809	2,957,637	1,290,697	537
Quarries, sand and gravel pits	8,851	26,644,793	14,431,742	6,013
Diamond drilling contractors	769	3,189,049	1,516,409	632
Total	34,086	$157,586,161	67,779,812	28,241

ACCIDENTS

During 1963 and 1964 the Department of Natural Resources received reports of 833 and 905 accidents respectively that occurred in mines, quarries, peat bogs and sand and gravel pits in Quebec, compared with 795 accidents reported in 1962.

Included in these figures are 11 and 23 fatalities respectively and 822 and 882 accidents respectively of over three days' lost time or otherwise compensable.

Accidents and man-hours worked at the railway terminals of Sept-Iles and Port-Cartier and those of the Sorel and Valleyfield refineries are not included in the accident statistics that follow.

The accident rate per million man-hours worked was 13.6 for 1963 and 14.5 for 1964.

Accident prevention work was continued throughout the Province of Quebec and again resulted in a very low accident frequency rate. There remains, however, the fact that the accident frequency in mines is still too high and that still more intensive prevention efforts are necessary on the part of employers and employees. In this respect Gaspe Copper Mines Limited won the John T. Ryan Safety Trophy for 1963 and 1964, this mine having suffered no compensable accident during 1963 and a frequency of only 2.7 for 1964.

The Mine Rescue Training Plan, sponsored by the Quebec Metal Mines Accident Prevention Association and the Quebec Asbestos Mining Association, operated throughout the Province under the supervision of the Department of Natural Resources. Active mine rescue personnel was distributed among 26 mines and numbered 358 men in 1963; among 32 mines and numbered 377 men in 1964. Seveny-three (73) in 1963 and eighty (80) in 1964 new certificates in mine rescue training were awarded.

Mine Rescue Stations

The number of main mine rescue stations remained unchanged. However, one sub-station at Matagami was established at Mattagami Lake Mines Limited in 1963.

Following is the location of the mine rescue stations:

Bourlamaque	Main station
Noranda	" "
Thetford Mines	" "
Campbell Chibougamau Mines Ltd.	Sub-station
Canadian Refractories Ltd. (Kilmar)	" "
Gaspé Copper Mines Ltd	" "
Mattagami Lake Mines Ltd.	" "
New Calumet Mines Ltd.	" "
Normetal Mining Corp. Ltd.	" "
Opemiska Copper Mines Ltd.	" "
The Coniagas Mines Ltd.	" "
The Patino Mining Corp. (Copper Rand Mines Div.)	" "

Annual Mine Rescue Competition

The annual provincial mine rescue competition was held at Val-d'Or, in September, 1963, and at Thetford Mines in September, 1964. In 1963 the trophy for proficiency in mine rescue operations was won by a team from East Malartic Mines Limited competing with seven (7) other teams. In 1964 this same trophy was won by a team from The Bell Asbestos Mines Limited, again with seven (7) other teams competing.

Table 57a - Number of Victims of Accidents in Mines, Quarries and Annexed Plants in Quebec in 1963

	Fatal Accidents		Non-fatal Accidents		Total	
	No.	%	No.	%	No.	%
Mines:						
Surface	3	0.4	165	19.8	168	20.2
Underground	4	0.5	332	39.9	336	40.4
Open-pits	0	0.0	50	6.0	50	6.0
Totals	7	0.9	547	65.7	554	66.6
Quarries:						
Surface	1	0.1	117	14.0	118	14.1
Totals	1	0.1	117	14.0	118	14.1
Annexed Plants:						
Repair shops	1	0.1	53	6.3	54	6.4
Crushing Plants	1	0.1	39	4.7	40	4.8
Concentrators	0	0.0	38	4.6	38	4.6
Dressing plants	0	0.0	13	1.6	13	1.6
Warehouses	0	0.0	8	1.0	8	1.0
Power Plants	0	0.0	4	0.5	4	0.5
Construction	1	0.1	2	0.2	3	0.3
Lime kilns	0	0.0	1	0.1	1	0.1
Totals	3	0.3	158	19.0	161	19.3
Grand Totals:	11	1.3	822	98.7	833	100.0

Table 57b - Number of Victims of Accidents in Mines, Quarries and Annexed Plants in Quebec in 1964

	Fatal Accidents		Non-fatal Accidents		Total	
	No.	%	No.	%	No.	%
Mines:						
Surface	0	0.0	224	24.8	224	24.8
Underground	12	1.3	379	41.9	391	43.2
Open-pits	2	0.2	42	4.6	44	4.8
Totals:	14	1.5	645	71.3	659	72.8
Quarries:						
Surface	4	0.5	74	8.2	78	8.7
Totals:	4	0.5	74	8.2	78	8.7
Annexed Plants:						
Repair shops	0	0.0	58	6.5	58	6.5
Concentration plants	2	0.2	48	5.3	50	5.5
Crushing plants	1	0.1	23	2.5	24	2.6
Dressing plants	0	0.0	9	1.0	9	1.0
Warehouses	0	0.0	7	0.8	7	0.8
Refining plants	0	0.0	7	0.8	7	0.8
Power plants	0	0.0	5	0.5	5	0.5
Lime kilns	0	0.0	3	0.3	3	0.3
Construction	2	0.2	3	0.3	5	0.5
Totals:	5	0.5	163	18.0	168	18.5
Grand Totals:	23	2.5	882	97.5	905	100.0

Table 58a - Analysis of Fatal Accidents in Mines, Quarries and Annexed Plants in Quebec in 1963

	Under-ground	Surface	Open-pits	Annexed Plants	Total	
					No.	%
Mines:						
Slide of rock or other materials	2	0	0	0	2	18.2
Fall of persons	1	0	0	1	2	18.2
Fall of rock	1	0	0	0	1	9.1
Machinery and tools	0	1	0	0	1	9.1
Flying rock or object	0	0	0	1	1	9.1
Miscellaneous	0	1	0	0	1	9.1
Haulage and transportation	0	1	0	0	1	9.1
Total, mines:	4	3	0	2	9	81.9
Quarries:						
Haulage and transportation	0	1	0	0	1	9.1
Gears, belting etc........	0	0	0	1	1	9.1
Total, quarries:	0	1	0	1	2	18.2
Total, mines and quarries	4	4	0	3	11	100.0

The ages of victims of fatal accidents in mines, quarries and annexed plants are shown in the following table for 1963.

Table 58b - Fatalities According to Age Groups

18-21	22-25	26-29	30-33	34-37	38-41	Total
3	1	2	2	1	2	11

Table 59a - Analysis of Fatal Accidents in Mines, Quarries and Annexed Plants in Quebec in 1964

	Under-ground	Surface	Open-pits	Annexed Plants	Total	
					No.	%
Mines:						
Explosives	4	0	1	0	5	21.8
Flying rock or object	1	0	1	0	2	8.8
Fall of person	2	0	0	0	2	8.8
Fall of rock	2	0	0	0	2	8.8
Fall of object	0	0	0	1	1	4.3
Machinery and tools	0	0	0	1	1	4.3
Electricity	0	0	0	1	1	4.3
Slide of rock or other material	1	0	0	0	1	4.3
Hoisting	1	0	0	0	1	4.3
Scaling	1	0	0	0	1	4.3
Total, mines:	12	0	2	3	17	74.0
Quarries:						
Slide of rocks or other objects	0	1	0	1	2	8.8
Haulage and transportation	0	1	0	0	1	4.3
Fall of object	0	0	0	1	1	4.3
Flying rock or object	0	1	0	0	1	4.3
Loading bin	0	1	0	0	1	4.3
Total, quarries:	0	4	0	2	6	26.0
Total, mines and quarries:	12	4	2	5	23	100.0

The ages of victims of fatal accidents in mines, quarries and annexed plants are shown in the following table for 1964.

Table 59b - Fatalities According to Age Groups

19-22	23-27	28-32	33-37	38-42	43-47	48-52	53 and over	Total
2	7	3	5	1	2	1	2	23

Table 60a. - Summary of Fatal Accidents in Mines, Quarries and Annexed Plants in Quebec in 1963

No.	Date	Mine or Quarry	Employer	Locality	Victim	Age	Marital Status	Occupation	Place	Cause of Accident
1	Jan. 10	Lamaque Mining Co. Ltd.	Lamaque Mining Co. Ltd.	Lamaque	Gaétan Grignon	18	Single	Miner	575-2-194 stope, mine No. 3	Rock fall
2	Jan. 22	Solbec Copper Mines Ltd.	Solbec Copper Mines Ltd.	Stratford	Luc Breton	28	Married, 2 children	Driver of mechanical loader	Access road to the mine	Haulage and transportation
3	Mar. 13	Iron Ore Co. of Canada	Iron Ore Co. of Canada	Schefferville	Antonio-Henri St-Pierre	29	Married, 1 child	Apprentice mechanic	Garage, Ferriman mine	Flying rock or object
4	Apr. 18	Malartic Hygrade Gold Mines Ltd.	Malartic Hygrade Gold Mines Ltd.	Malartic	Hilaire Champagne	34	Married, 7 children	Miner	2-02 drift	Rock slide
5	Apr. 18	Malartic Hygrade Gold Mines Ltd.	Malartic Hygrade Gold Mines Ltd.	Malartic	Maurice Langlais	30	Married, 3 children	Miner	2-02 drift	Rock slide
6	Apr. 19	Orchan Mines Ltd.	Central Bridge Co. Ltd.	Galinée Township	Raymond Clément	21	Single	Construction worker	Ore bin at Orchan Mines plant	Fall of person
7	Apr. 25	Orenada Mines Ltd.	Inspiration Diamond Drilling Co.	Bourlamaque Township	Jean-Hector Parizé	37	Married, 3 children	Cook	Bourlamaque river	Drowning
8	Aug. 19	Campbell Chibougamau Mines Ltd.	Campbell Chibougamau Mines Ltd.	Chibougamau	John Robert Irwin	38	Single	Miner	Ore chute, main mine	Fall of person
9	Aug. 23	L.-P. Gagnon Ltée.	L.-P. Gagnon Ltée.	St-David, Lévis County	Jean-Baptiste Labonté	39	Married, 2 children	Loader driver	St-David quarry	Haulage and transportation
10	Nov. 24	Bruneau Mines Ltd.	R.F. Fry and Associates Ltd.	Chibougamau	Roger Caron	25	Single	Mechanic	Bruneau Mines Ltd., McKenzie Township	Machinery and tools
11	Dec. 5	Dulude quarry	Les Carrières Goyer, Dominion Lime Ltd. Div.	St-Bruno	Jacques Paquin	21	Single	Mechanic's helper	Crushing plant, Dulude quarry	Gears, belts

Table 60b.- Summary of Fatal Accidents in Mines, Quarries and Annexed Plants in Quebec in 1964

No.	Date	Mine or Quarry	Employer	Locality	Victim	Age	Marital Status	Occupation	Place	Cause of Accident
1	Jan. 9	Domtar Chemicals Ltd.	Domtar Chemicals Ltd.	Joliette	Valmore Florent	56	Married, 1 chlid	Foreman	Upper bench of quarry	Haulage and transportation
2	Jan. 10	Bell Asbestos Mines Ltd.	Bell Asbestos Mines Ltd.	Thetford Mines	Florian Fréchette	34	Married, 3 children	Electrician	Fiberizing plant	Machinery and tools
3	Feb. 1	Sablière St-Félix Enr.	Sablière St-Félix Enr.	St-Félix-de-Valois	P.-A. Robillard	27	Single	Mechanic for truck loading installation	Sand pit	Loading bin
4	Feb. 7	The Patino Mining Corp.	The Patino Mining Corp.	Chibougamau	Richard Desjardins	35	Married	Foreman for filling work	Copper Rand mine	Explosives
5	Mar. 4	East Malartic Mines Ltd.	East Malartic Mines Ltd.	Malartic	Lorenzo Martineau	37	Married, 4 children	Miner	22-61 cross-cut at the 3,445-foot level	Flying object
6	Mar. 18	Jaculet mine	R.F. Fry and Associates Ltd.	Chibougamau	Normand Lafrenière	25	Married	Miner	Mine shaft	Fall of person
7	Apr. 7	Opemiska Copper Mines (Quebec) Ltd.	Opemiska Copper Mines (Quebec) Ltd.	Chapais	Léon-M. Dallaire	27	Married, 1 child	Miner	9-3-8 stope	Fall of rock
8	July 12	French mine	Iron Ore Co. of Canada	Schefferville	Cyrille Gauthier	36	Married	Pumping service	Mine sump	Flying object
9	July 29	Wasamac Mines Ltd.	Industrial and Mine Installations (Quebec) Ltd.	Arntfield	William Fedorkow	25	Single	Electrician	Wasamac Mines Ltd.	Electricity
10	Aug. 6	Wasamac Mines Ltd.	Wasamac Mines Ltd.	Arntfield	Marcel Lemire	26	Married, 3 children	Miner	1,000-foot level station	Explosives
11	Aug. 7	Kiena Gold Mines Ltd.	Evert Ross and Associates Ltd.	Val-d'Or	Régis Desjardins	41	Married, 4 children	Shaft foreman	1,250-foot level	Rock slide
12	Aug. 20	Wasamac Mines Ltd.	Industrial and Mine Installation (Quebec) Ltd.	Arntfield	Paul Major	52	Married, 4 children	Joiner	Treatment plant	Fall of object

Table 60b . - Summary of Fatal Accidents in Mines, Quarries and Annexed Plants in Quebec in 1964 (Cont'd.)

No.	Date	Mine or quarry	Employer	Locality	Victim	Age	Marital Status	Occupation	Place	Cause of accident
13	Aug. 21	Sablière Léopold Desmarais	Léopold Desmarais	Ste-Mélanie	Joseph Vincent	67	Married, 10 children	Truck loader	Sand pit	Slide of non-consolidated material
14	Aug. 25	Quebec Cartier Mining Co.	Quebec Cartier Mining Co.	Gagnon	William M. Braun	44	Married, 3 children	Blaster	Open-pit, Jeannine lake	Explosives
15	Aug. 26	The Coniagas Mines Ltd.	The Coniagas Mines Ltd.	Desmaraisville	Jean Tanquerel	23	Single	Skip operator	Headframe	Hoisting in shaft
16	Sept. 14	Dominion Lime Ltd.	Dominion Lime Ltd.	Lime Ridge	James MacKay	43	Married, 4 children	Supervisor for installation and manufacture of agricultural lime	Installation, manufacture of agricultural lime	Rock slide
17	Sept. 23	United Obalski Mining Co. Ltd.	Evert Ross and Associates Ltd.	Chibougamau	Raymond Vallière	27	Married, 1 child	Shift chief	250-foot level drift	Explosives
18	Sept. 23	United Obalski Mining Co. Ltd.	Evert Ross and Associates Ltd.	Chibougamau	Georges Dupuis	33	Married, 4 children	Miner	250-foot level drift	Explosives
19	Oct. 7	Lamaque Mining Co. Ltd.	Lamaque Mining Co. Ltd.	Bourlamaque	Johnny Bjecovitch	21	Single	Miner	26-H-25 stope, No. 1 mine	Scaling
20	Oct. 31	Bevcon Mines Ltd.	Bevcon Mines Ltd.	Perron	Josef Bozic	29	Single	Miner	2207 chute, 2,225-foot level	Fall of rock
21	Nov. 9	Quemont Mining Corp. Ltd.	Quemont Mining Corp. Ltd.	Noranda	Michel Sénécal	19	Single	Helper, underground	Ore chute 1,620-foot level	Fall of person
22	Nov. 21	Les Carrières Martineau and Deschambault Inc.	Les Carrières Martineau and Deschambault Inc.	Riv.-à-Pierre	Jean-Guy Doyer	32	Married	Crane-operator	Hoist shack at quarry	Flying rock
23	Nov. 27	Carrières T.R.P. Ltée.	Carrières T.R.P. Ltée	Henrysburg	Normand Garceau	32	Married, 5 children	Laborer	Garage on the quarry property	Fall of object

The following table shows the accident frequency rate from 1955 to 1964.

Table 61 - Accident Rates per 1,000,000 Man-hours

	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964
Mines and annexed plants	15.7	17.0	15.5	12.0	14.2	14.2	13.8	13.4	13.9	16.6
Quarries and annexed plants	9.8	15.4	12.4	9.7	11.1	12.1	16.1	12.2	12.5	7.6
Mining Industry	14.3	16.7	14.8	11.9	13.5	13.9	14.3	13.1	13.6	14.5

Tables 62a and 62b present a summary of accidents in mines, quarries and annexed plants in 1963 and 1964.

Table 62a - Summary of Accidents in Mines, Quarries and Annexed Plants in Quebec in 1963

	Number of Million Man-hours	Accidents			Per Million Man-hours
		Fatal	Non-fatal	Total	
Mines and annexed plants	47.294	9	649	658	13.9
Quarries and annexed plants	14.025	2	173	175	12.5
Totals	61.319	11	822	833	13.6

Table 62b - Sumary of Accidents in Mines, Quarries and Annexed Plants in Quebec in 1964

	Number of Million Man-hours	Accidents			Per Million Man-hours
		Fatal	Non-fatal	Total	
Mines and annexed plants	47.964	17	778	795	16.6
Quarries and annexed plants	14.431	6	104	110	7.6
Totals	62.395	23	882	905	14.5

Non-fatal Accidents

Tables 63a and 63b, 64a and 64b, 65a and 65b classify the non-fatal accidents as to cause.

Mines

In Quebec mines, statistics show that, in 1963, fall of person caused the largest number of accidents and that, in 1964, handling of rock or other objects was responsible for these accidents.

Table 63a - Non-fatal Accidents in Mines in 1963

Cause of Accident	Under-ground	Open-pits	Surface and Annexed Plants	Total	
				No.	%
Fall of person	34	2	40	76	11.7
Diamond drilling	27	0	47	74	11.4
Handling of rock or other object	29	1	35	65	10.0
Machinery and tools	11	7	38	56	8.6
Lifting heavy objects	28	4	22	54	8.3
Haulage and transportation	27	11	9	47	7.2
Drilling	26	7	3	36	5.5
Fall of rock	32	1	0	33	5.1
Fall of object	11	0	14	25	3.9
Scaling	14	3	2	19	2.9
Scaffolding and ladders	10	1	8	19	2.9
Flying rock or object	5	4	9	18	2.8
Sundries	6	3	7	16	2.5
Gears, belts, etc.	0	0	14	14	2.2
Scraping	13	0	0	13	2.0
Sliding of rock or other object	11	1	0	12	1.8
Power shovel or rolling bridge crane	9	3	0	12	1.8
Loading bin	8	0	1	9	1.4
Burns	0	0	8	8	1.3
Hand haulage	7	0	0	7	1.1
Mining in shaft	5	0	1	6	0.9
Nails	4	0	2	6	0.9
Timbering	5	0	0	5	0.8
Electricity	1	1	3	5	0.8
Dust	2	0	2	4	0.6
Explosives	3	0	1	4	0.6
Sledging	2	0	1	3	0.5
Mucking	2	1	0	3	0.5
Totals	332	50	267	649	100.0

Table 63b- Non-fatal Accidents in Mines in 1964

Cause of Accident	Under-ground	Open-pits	Surface and Annexed Plants	Total	
				No.	%
Handling of rock or other object...	34	7	60	101	13.0
Diamond drilling	18	0	75	93	12.0
Machinery and tools	20	3	51	74	9.5
Fall of person	37	7	26	70	9.0
Drilling	51	2	1	54	6.9
Lifting of heavy objects	22	1	17	40	5.1
Haulage and transportation	19	12	8	39	5.0
Fall of rock	37	0	2	39	5.0
Sundries	11	0	25	36	4.6
Fall of object	6	1	22	29	3.7
Scaling	28	0	0	28	3.6
Mechanical shovel or bridge crane .	11	8	9	28	3.6
Flying rock or object	10	1	14	25	3.2
Scaffolding and ladders	14	0	7	21	2.7
Burns	1	0	17	18	2.3
Hand haulage	14	0	2	16	2.2
Sliding of rock or other object ...	10	0	4	14	1.8
Gears, belts etc.	2	0	8	10	1.3
Shaft mining	7	0	0	7	0.9
Scraping	6	0	0	6	0.8
Sledging	4	0	2	6	0.8
Explosives	6	0	0	6	0.8
Mucking	3	0	2	5	0.7
Loading bin	4	0	0	4	0.5
Electricity	0	0	3	3	0.4
Timbering	2	0	0	2	0.2
Dust	0	0	2	2	0.2
Nails	2	0	0	2	0.2
Totals ...	379	42	357	778	100.0

Quarries

During 1963 more than 59% of the non-fatal accidents that occured in Quebec quarries were caused by handling of rock or other objects, by machinery and tools, and by fall of person, as shown in the following table.

Table 64a - Non-fatal Accidents in Quebec Quarries in 1963

Cause of Accident	Surface	Annexed Plants	Total	
			No.	%
Handling of rock or other object	30	12	42	24.3
Machinery and tools	15	16	31	17.9
Fall of person	18	11	29	16.8
Fall of object	14	4	18	10.4
Haulage and transportation	10	1	11	6.4
Mechanical shovel or crane	9	0	9	5.2
Drilling	8	0	8	4.6
Burns	2	4	6	3.5
Flying rock or other object	3	3	6	3.5
Gears, belts, etc.	1	3	4	2.3
Lifting of heavy objects	2	0	2	1.1
Explosives	2	0	2	1.1
Sundries	1	1	2	1.1
Dust	1	0	1	0.6
Sledging	0	1	1	0.6
Fall of rock	1	0	1	0.6
Totals	117	56	173	100.0

During 1964 the first three chief causes of non-fatal accidents in quarries were handling of rock or other object, fall of person and fall of object. These represent 47% of the total, as shown below.

Table 64b - Non-fatal Accidents in Quebec Quarries in 1964

Cause of Accident	Surface	Annexed Plants	Total	
			No.	%
Handling of rock or other object	10	8	18	17.3
Fall of person	13	3	16	15.4
Fall of pbject	13	2	15	14.4
Machinery and tools	6	7	13	12.5
Flying rock or object	7	3	10	9.6
Fall of rock	5	1	6	5.8
Miscellaneous	6	0	6	5.8
Haulage and transportation	2	2	4	3.8
Gears, belts, etc.	3	1	4	3.8
Burns	2	1	3	2.9
Drilling	2	0	2	1.9
Electricity	1	1	2	1.9
Dust	1	1	2	1.9
Nails	1	0	1	1.0
Mechanical shovel or crane	1	0	1	1.0
Lifting of heavy objects	1	0	1	1.0
Totals	74	30	104	100.0

Annexed Plants

Machinery and tools, handling of rock or other objects and fall of person ranked highest among the causes of non-fatal accidents in annexed plants, being responsible for 58.3% of the accidents. The percentage for 1964 was 53.4%.

Table 65a -Non-fatal Accidents in Annexed Plants in 1963

Cause of Accident	Repair Shops	Concentration Plants	Crushing Plants	Dressing Plants	Warehouses	Power Plants	Construction	Lime Kilns	Total	
									No.	%
Machinery and tools	20	7	6	1	0	1	1	0	36	22.8
Handling rock or other object	2	7	11	7	2	2	0	1	32	20.3
Fall of person	9	3	9	0	2	0	1	0	24	15.2
Gears, belts, etc.	0	11	4	0	0	0	0	0	15	9.5
Fall of object	4	2	4	2	1	0	0	0	13	8.2
Lifting heavy objects ...	3	3	2	0	0	0	0	0	8	5.1
Flying rock or object ...	6	1	1	0	0	0	0	0	8	5.1
Burns	5	0	0	1	0	0	0	0	6	3.8
Scaffold and ladders	2	3	0	0	0	0	0	0	5	3.2
Haulage and transportation	0	0	1	1	2	0	0	0	4	2.5
Miscellaneous	1	0	1	0	0	0	0	0	2	1.3
Loading bin	0	1	0	0	0	0	0	0	1	0.6
Sledging	0	0	0	1	0	0	0	0	1	0.6
Electricity	0	0	0	0	0	1	0	0	1	0.6
Nails	1	0	0	0	0	0	0	0	1	0.6
Scaling	0	0	0	0	1	0	0	0	1	0.6
Totals	53	38	39	13	8	4	2	1	158	100.0

Table 65b - Non-fatal Accidents in Annexed Plants in 1964

Cause of Accident	Repair Shops	Concentration Plants	Crushing Plants	Dressing Plants	Warehouses	Refineries	Power Plants	Lime Kilns	Construction	Total No.	Total %
Handling rock or other object	12	15	1	4	5	1	0	1	0	39	23.9
Machinery and tools ..	19	3	4	2	0	2	2	0	1	33	20.3
Fall of object	5	4	3	0	1	2	0	0	0	15	9.2
Sundries	3	8	0	1	0	0	0	0	0	12	7.4
Flying rock or object	3	4	2	0	0	0	0	1	0	10	6.1
Burns	4	2	2	0	0	0	1	1	0	10	6.1
Gears, belts, etc. ...	2	5	2	0	0	0	0	0	0	9	5.5
Fall of person	3	1	2	1	0	0	1	0	0	8	4.9
Lifting of heavy objects	1	3	0	0	0	0	1	0	1	6	3.7
Scaffolds and ladders	2	1	2	0	0	0	0	0	0	5	3.1
Electricity	1	1	1	1	0	0	0	0	0	4	2.6
Mechanical shovel or crane	1	0	1	0	0	1	0	0	0	3	1.8
Dust	1	0	0	0	1	0	0	0	0	2	1.2
Haulage and transportation	1	0	1	0	0	0	0	0	0	2	1.2
Hand tramming	0	1	0	0	0	0	0	0	0	1	0.6
Mucking	0	0	0	0	0	1	0	0	0	1	0.6
Fall of rock	0	0	1	0	0	0	0	0	0	1	0.6
Slide of rocks or other object	0	0	1	0	0	0	0	0	0	1	0.6
Sledging	0	0	0	0	0	0	0	0	1	1	0.6
Totals ...	58	48	23	9	7	7	5	3	3	163	100.0

The following tables show the frequency of injuries that occurred in mines to various parts of the body. It may be noted that 74.4% in 1963 and 73.3% in 1964 of these injuries affected the hands, the legs, the trunk and the feet.

Table 66a- Location of Injuries on Body
(For the Year 1963)

Parts of the body	Number of Accidents	%
Hands	169	25.7
Legs	119	18.1
Trunk	117	17.8
Feet	84	12.8
Back sprain	52	7.9
Head	44	6.7
Arms	42	6.3
Eyes	16	2.4
General	14	2.1
Poisoning	1	0.2
Totals .	658	100.0

Table 66b - Location of Injuries on Body
(For the Year 1964)

Parts of the body	Number of Accidents	%
Hands	194	24,4
Trunk	163	20.5
Legs	117	14.7
Feet	109	13.7
Back sprain	63	7.9
Head	52	6.5
Arms	50	6.3
Eyes	33	4.2
General	14	1.8
Totals .	795	100.0

The following tables show the frequency of injuries that occurred in quarries to various parts of the body. It may be noted that, in 1963, 79.4% of these injuries affected hands, trunk, legs and feet, whereas, in 1964, 69% of the injuries were to hands, feet, eyes and trunk.

Table 67a - Location of Injuries on Body
(For the Year 1963)

Parts of the body	Number of Accidents	%
Hands	51	29.1
Trunk	34	19.4
Legs	30	17.1
Feet	24	13.8
Head	11	6.3
Arms	9	5.1
Eyes	8	4.6
Back sprain	4	2.3
General	4	2.3
Totals ...	175	100.0

Table 67b - Location of Injuries on Body
(For the Year 1964)

Parts of the body	Number of Accidents	%
Hands	26	23.6
Feet	20	18.2
Eyes	15	13.6
Trunk	15	13.6
Legs	12	10.9
Head	8	7.3
Arms	7	6.4
General	5	4.6
Back sprain	2	1.8
Totals ...	110	100.0

Table 68 - Employment and Accidents to Employees in Mines and Annexed Plants

Year	Number of Employees	Persons Injured			Number of Million Man-hours			Rate per Million Man-hours	
		Fatally	Non-fatally	Total	Producing Mines	Non-producing Mines	Total	Fatally	Non-fatally
1944	13,973	20	1,717	1,737	29.686	1.742	31.428	0.64	55
1945	13,805	22	1,616	1,638	25.920	4.118	30.038	0.73	54
1946	15,578	20	1,754	1,774	26.906	7.899	34.805	0.57	50
1947	16,774	36	1,447	1,483	30.023	6.840	36.863	0.98	39
1948	17,283	22	1,298	1,320	33.883	5.386	39.269	0.56	33
1949	17,489	24	1,072	1,096	35.062	2.827	37.889	0.63	28
1950	19,103	25	926	951	39.186	3.749	42.935	0.58	22
1951	20,430	25	960	985	40.979	4.788	45.767	0.55	21
1952	22,398	21	826	847	41.808	6.650	48.458	0.43	17
1953	21,283	16	719	735	37.520	6.382	43.902	0.36	16
1954	21,404	29	572	601	38.439	5.916	44.355	0.65	13
1955	22,319	27	721	748	44.091	3.602	47.693	0.57	15
1956	24,765	21	858	879	46.146	5.664	51.810	0.41	17
1957	24,037	24	770	794	44.756	6.304	51.060	0.47	15
1958	22,121	14	586	600	42.848	2.548	45.396	0.30	13
1959	23,752	18	651	669	47.349	2.259	49.608	0.36	13
1960	23,109	17	659	676	45.955	1.593	47.548	0.37	14
1961	23,632	13	621	634	44.141	1.852	45.993	0.28	14
1962	24,282	18	610	628	45.407	1.409	46,816	0.38	13
1963	25,021	9	649	658	46.161	1.334	47.495	0.19	14
1964	25,235	17	778	795	46.674	1.291	47.965	0.35	16
Totals	436,528	438	19,810	20,248	832.940	84.153	917.093	-	-
Average	20,787	21	943	964	39.569	4.007	43.671	0.48	22

Table 69 - Employment and Accidents to Employees in Quarries and Annexed Plants

Year	Number of Employees	Persons Injured			Number of Million Man-hours	Rate per Million Man-hours	
		Fatally	Non-fatally	Total	Producing Quarries	Fatally	Non-fatally
1944	4,526	3	278	281	6.300	0.48	44
1945	4,762	3	323	326	7.130	0.42	45
1946	5,927	3	345	348	9.528	0.31	36
1947	6,591	1	394	395	11.014	0.09	36
1948	8,221	4	322	326	12.727	0.31	25
1949	7,411	5	345	350	12.468	0.40	28
1950	7,340	6	218	224	12.055	0.50	18
1951	8,068	8	164	172	13.027	0.62	13
1952	8,412	2	172	174	13.061	0.15	13
1953	7,805	4	136	140	12.890	0.31	11
1954	8,276	3	136	139	13.498	0.22	10
1955	8,784	6	134	140	14.246	0.42	9
1956	6,978	6	180	186	12.108	0.50	15
1957	9,326	2	183	185	14.902	0.13	12
1958	8,857	0	134	134	13.799	0.00	9
1959	9,232	1	150	151	13.642	0.07	11
1960	9,136	4	168	172	13.435	0.29	12
1961	8,266	6	201	207	12.858	0.47	16
1962	9,050	2	165	167	13.697	0.15	12
1963	9,096	2	173	175	14.025	0.14	12
1964	8,851	6	104	110	14.432	0.42	7
Totals	164,915	77	4,425	4,502	260.836	-	-
Average	7,853	4	211	214	12.421	0.32	17

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